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PROPERTY OF
L. F. [illegible]
3924 [illegible]

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BC- 13B, M.
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BT- 12BZ, M, M2
BT- 13B, M.

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DENVER, COLORADO

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 275

Admiral chassis 21A3AZ, 21A3Z, 21C3Z and 21G3Z were covered in Photofact Folder 2 in Set 275.

Chassis 21A3BZ, 21B3Z, 21D3Z, 21E3BZ, 21E3Z and 21H3Z are added with the publication of this bulletin.

The following chart of new models, chassis and picture tube used in each is given below:

MODEL	CHASSIS	PICTURE TUBE
CA2316Z	21B3Z	21AMP4A
CA2317Z	21B3Z	21AMP4A
CA2326Z	21B3Z	21AMP4A
CA2327Z	21B3Z	21AMP4A
CA2826Z	21H3Z	27RP4
CA2827Z	21H3Z	27RP4
FA2326Z	21B3Z	21AMP4A
FA2327Z	21B3Z	21AMP4A
FA2328Z	21B3Z	21AMP4A
LA2326Z	21D3Z	21AMP4A
LA2327Z	21D3Z	21AMP4A
TA2311Z	21B3Z	21AMP4A
TA2312Z	21B3Z	21AMP4A
TA2316Z	21B3Z	21AMP4A
TA2317Z	21B3Z	21AMP4A
	21A3BZ	21ALP4A
	21E3BZ	21ALP4A
	21E3Z	21AMP4A

CHASSIS IDENTIFICATION

Following is a brief comparison of chassis; later in this bulletin a detailed list of all changes will be given.

Ch. 21A3BZ — Chassis 21A3BZ is very similar to chassis 21A3AZ, except that it uses a 21ALP4A picture tube.

Ch. 21B3Z — Chassis 21B3Z is very similar to chassis 21A3AZ, except it is a UHF-VHF chassis employing a 41MC IF Strip.

Ch. 21D3Z — Chassis 21D3Z is very similar to chassis 21B3Z, except it has a built-in AM radio.

Ch. 21E3BZ — Chassis 21E3BZ is very similar to chassis 21B3Z, except that it uses a 21ALP4A picture tube and a different UHF-VHF tuner.

Ch. 21E3Z — Chassis 21E3Z is very similar to chassis 21B3Z, except that it uses a different UHF-VHF tuner.

PRODUCTION CHANGES
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ADMIRAL CHASSIS 21A3BZ, 21B3Z, 21D3Z, 21E3BZ, 21E3Z, 21H3Z

PRODUCTION CHANGES
BULLETIN 174

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1956 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

Ch. 21H3Z	Chassis 21H3Z is very similar to chassis 21B3Z, except that it uses a 27RP4 picture tube.
Ch. 21A3BZ	Chassis 21A3BZ is electrically identical to chassis 21A3AZ, except for the following chassis. A 21ALP4A picture tube is used in this chassis. A 3.9Ω, ½ W resistor is added from pin 2 of V19 in series with the high voltage rectifier filament winding. A 560K, ½ W resistor is wired in parallel with R92. SWEEP COMPONENTS CHANGED T2, vertical oscillator transformer changed to part #79B63-1. T4, vertical output transformer changed to part #79B43-7. T5, deflection yoke changed to part #94D87-6. T3, horizontal output transformer changed to part #79C60-7. Merit #HVO-38 is a direct replacement transformer. A partial schematic showing the new circuit is shown in Fig. 2.
Ch. 21B3Z	UHF-VHF SETS Chassis 21B3Z is electrically identical to chassis 21A3AZ, except it is a UHF-VHF set utilizing a 41MC IF strip. UHF tuner 94D66-1 and VHF tuner 94D64-4 are used in this chassis. VHF tuner 94D64-4 and the 41MC IF strip are shown in Fig. 1. UHF tuner 94D66-1 is shown in Fig. 3. Complete alignment procedure for tuners 94D66-1, 94D64-4 and the 41MC IF strip is given in this bulletin. NEW VIDEO IF COILS L8 is changed to 39.75MC and 47.25MC trap assembly, part #73C16-2. L9, 1st. video IF coil changed to part #72B114-1. L10, 2nd. video IF coil changed to part #72D111-19. L11 is changed to a 41.25MC trap assembly, part #72D111-20. L12, 3rd. video IF coil changed to part #72D111-18. L13, 4th. video IF coil changed to part #72B143.
Ch. 21D3Z	Chassis 21D3Z is electrically identical to chassis 21B3Z, except for the following changes. A built-in AM radio (Model 3D1A) is included and is identical to the schematic shown on page 13 of Photofact Folder 275-2. COMPONENT CHANGE R86 is increased from 1 watt to 2 watts.
Ch. 21E3BZ	Chassis 21E3BZ is electrically identical to chassis 21B3Z, except for the following changes. UHF-VHF tuner 94E75-8 is used in this chassis. A schematic of the tuner is shown in Fig. 4. A 21ALP4A picture tube is used in this chassis. A 560K, ½ W resistor is wired in parallel with R92. A 3.9Ω, ½ W resistor is added from pin 2 of V19 in series with the high voltage rectifier filament winding. A 220Ω, ½ W resistor is added from C53 to the 135 voltage source. An RF choke (part #73A2-5) is added from the junction of C2B and C3 to the 135 voltage source. T3, horizontal output transformer changed to part #79C60-7. Merit #HVO-38 is a direct replacement transformer. A partial schematic showing the new circuit is shown in Fig. 2.
Ch. 21E3Z	Chassis 21E3Z is electrically identical to chassis 21B3Z, except for the following changes. UHF-VHF tuner 94E75-8 is used in this chassis. A schematic of the tuner is shown in Fig.4. T5, deflection yoke changed to part #94087-4. A 220Ω, ½ W resistor is added from C53 to the 135 voltage source. A 3.9Ω, ½ W resistor is added from pin 2 of V19 in series with the high voltage rectifier filament winding.

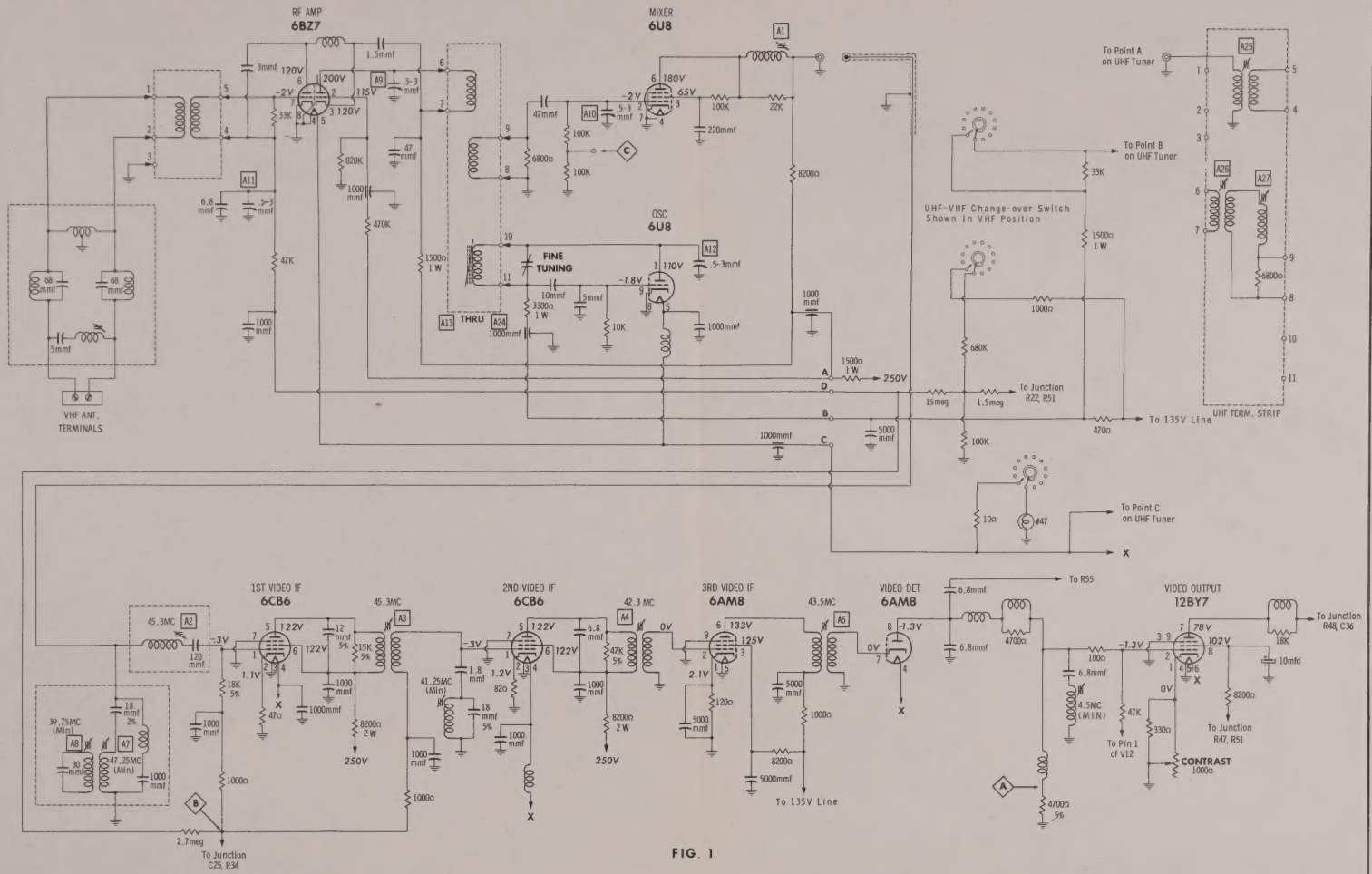
RF AMP
6BZ7
MIXER
6U8
OSC
6U8
FINE TUNING
THRU
VHF ANT. TERMINALS
UHF-VHF Change-over Switch Shown In VHF Position
To Point A on UHF Tuner
To Point B on UHF Tuner
To Point C on UHF Tuner
UHF TERM. STRIP
To Junction R22, R51
To 135V Line
250V
1ST VIDEO IF
6CB6
2ND VIDEO IF
6CB6
3RD VIDEO IF
6AM8
VIDEO DET
6AM8
VIDEO OUTPUT
12BY7
45.3MC
42.3 MC
43.5MC
39.75MC (Min)
47.25MC (Min)
41.25MC (Min)
4.5MC (MIN)
To Junction C25, R34
To R55
To Junction R48, C36
To Junction R47, R51
To Pin 1 of V12
CONTRAST
1000Ω
To 135V Line

FIG. 1

Ch. 21E3Z	An RF choke (part #73A2-5) is added from the junction of C2B and C3 to the 135 voltage source. T3, horizontal output transformer changed to part #79C60-7. Merit #HVO-38 is a direct replacement transformer. A partial schematic showing the new circuit is shown in Fig. 2.
Ch. 21H3Z	Chassis 21H3Z is electrically identical to chassis 21B3Z, except for the following changes. A 27RP4 picture tube is used in this chassis. R86 is increased from 1 watt to 2 watts.

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage. Allow 15 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point Ⓑ. Connect positive lead to chassis. Disconnect the antenna lead-in and connect a short jumper across the antenna terminals. Set noise gate fully clockwise. Set the contrast control fully counter clockwise. Use only enough generator output to produce, usable indication on VTVM. (Use lowest DC scale). Signal generator should be checked against a crystal calibrator or other frequency standard for all absolute frequency calibration.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube. Low side to chassis.	45.3MC	Any	DC probe to point Ⓐ. thru decoupling network (Fig. 1). Common to chassis.	A1, A2, A3	Use only enough generator output to provide usable indication on VTVM. Adjust for maximum deflection.
2.	"	"	42.3MC	"	"	A4	"
3.	"	"	43.5MC	"	"	A5	"
4.	"	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection.
5.	"	"	47.25MC	"	"	A7	Reduce bias to 1½ volts. Adjust for MINIMUM deflection.
6.	"	"	39.75MC	"	"	A8	"
7.	"	"	45.3MC	"	"		Increase bias to 3 volts. Readjust A1, A2 and A3 for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected as under "Video IF Alignment". Use only enough sweep generator output to provide usable indication on the scope. If a separate marker generator is used couple it loosely to the high side of the sweep generator output lead on tube shield. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to chassis.	44.0MC (10MC Swp)	41.25MC 42.0MC 43.5MC 45.0MC 45.75MC	12 or any unused high band channel	Vert. Amp. thru decoupling filter (Fig.1). Low side to chassis.		Check for response similar to Fig. 2. If unequal peaks occur, SLIGHTLY retouch A6. If valley between peaks exceed 20%, adjust A5. If response still is not similar to Fig. 2, repeat entire IF alignment.

VHF RF AND MIXER ALIGNMENT

Connect negative lead of a 3 volt bias supply to the tuner AGC. Positive lead to chassis.
Sweep and marker generator outputs should be attenuated for MINIMUM outputs that will give usable indications on scope. The marker pips should be just barely visible on response curve.
If a separate marker generator is used, couple it loosely to antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis.	A9, A10	Adjust for response similar to Fig. 3.
10.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	All	"
11.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 3. If markers fall below 70% on any high band channel, make compromise adjustments of A9 and A10 with channel switch set to that channel. Check all other high band channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
12.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for response similar to Fig. 3. If marker falls below 70% on any low band channel, make compromise adjustment of All with channel switch set to that channel. Check all other low band channels to see if they have been seriously affected.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

VHF OSCILLATOR ALIGNMENT

Leave the bias connected as under "Video IF Alignment".
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A12.
The channel oscillator adjustment screws are reached thru a hole to the left of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru decoupling filter (Fig.1) to point (A).	A13	Adjust to place video marker at 50% on response curve as in Fig. 4. Sound marker should fall at less than 5% on curve. It may be necessary to temporarily increase sweep and marker generator output and scope gain to view the sound marker.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

ALTERNATE VHF OSCILLATOR ALIGNMENT

Tune in any local TV station. Set the fine tuning control to its mid-range position. Adjust the oscillator channel strip adjustment for clearest picture and best sound. Repeat procedure for all stations available in the area.

UHF 44MC IF ALIGNMENT

Set VHF tuner between channels 5 and 6. Connect the bias as under "Video IF Alignment". Remove crystal cover on top of UHF tuner so that the crystal is accessible. Remove the 1N190 crystal from the crystal holder.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	100Ω Carbon Resistor	High side thru 100Ω resistor to negative clip of crystal holder. Low side to chassis.	43.5MC (12MC Swp)	41.25MC 45.75MC	UHF	Vert. Amp. thru 10K to point (C). Low side to chassis.	A25, A26, A27	Very carefully tune A1 EXACTLY three turns counter clockwise. Adjust A25, A26, and A27 for response similar to Fig. 5. Adjust A25 for maximum amplitude near the center of response curve. Alternately adjust A26 and A27 for symmetrical response with proper bandwidth and marker placement as in Fig. 5. Readjust A1 EXACTLY three turns clockwise so that it is at its original setting.

UHF TUNER ALIGNMENT

The UHF tuner has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should seldom be required. Alignment should not be attempted unless the proper test equipment is available. If a separate marker generator is used, couple it loosely to the transmission line between the antenna terminals and the UHF tuner. Connect the negative lead of a 1.5 volt battery to point (B). Positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	503MC (12MC Swp)	503.5MC	19 (Approx.)	Vert. Amp. thru 10K to point (C). Low side to tuner chassis.	A28	Adjust to place marker in center of response curve as in Fig. 6. If UHF tuner is badly misaligned a very low amplitude response or very distorted response may be obtained and it may be necessary to roughly align the preselector. To do this remove the snap fastened bottom cover plate of the tuner. Adjust by bending the slotted preselector rotor trimmer segments until a suitable response is obtained. Do not remove the top cover of the UHF tuner.
16.	"	"	869MC (12MC Swp)	869.5MC	80 (Approx.)	"	A29	Adjust to place marker in center of response as in Fig. 6. If necessary, bend preselector rotor segments as in step 17 to obtain usable pattern on scope as in Fig. 6.
17.	"	"	887MC (12MC Swp)	885.25MC 889.75MC	83	"		Remove snap fastened bottom plate of tuner. Adjust both UHF trimmer tabs (located between each of two pairs of slotted rotor plates) by moving tabs up or down until a maximum amplitude response with video and sound markers as shown in Fig. 7 is obtained.

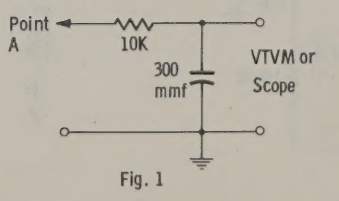

Fig. 1

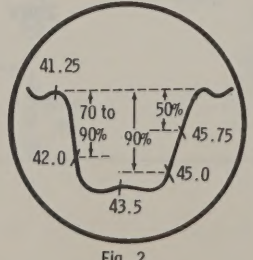

Fig. 2

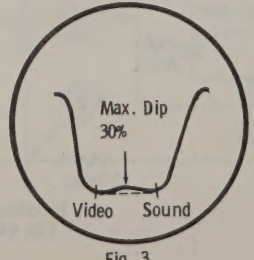

Fig. 3

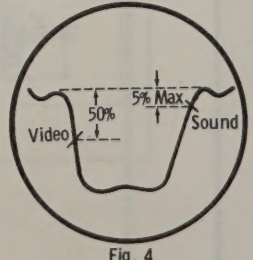

Fig. 4

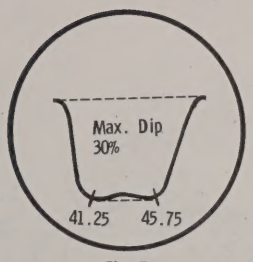

Fig. 5

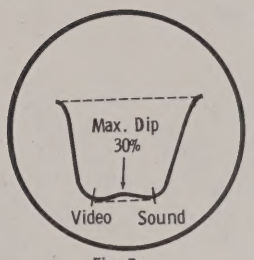

Fig. 7

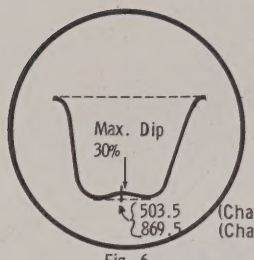

Fig. 6

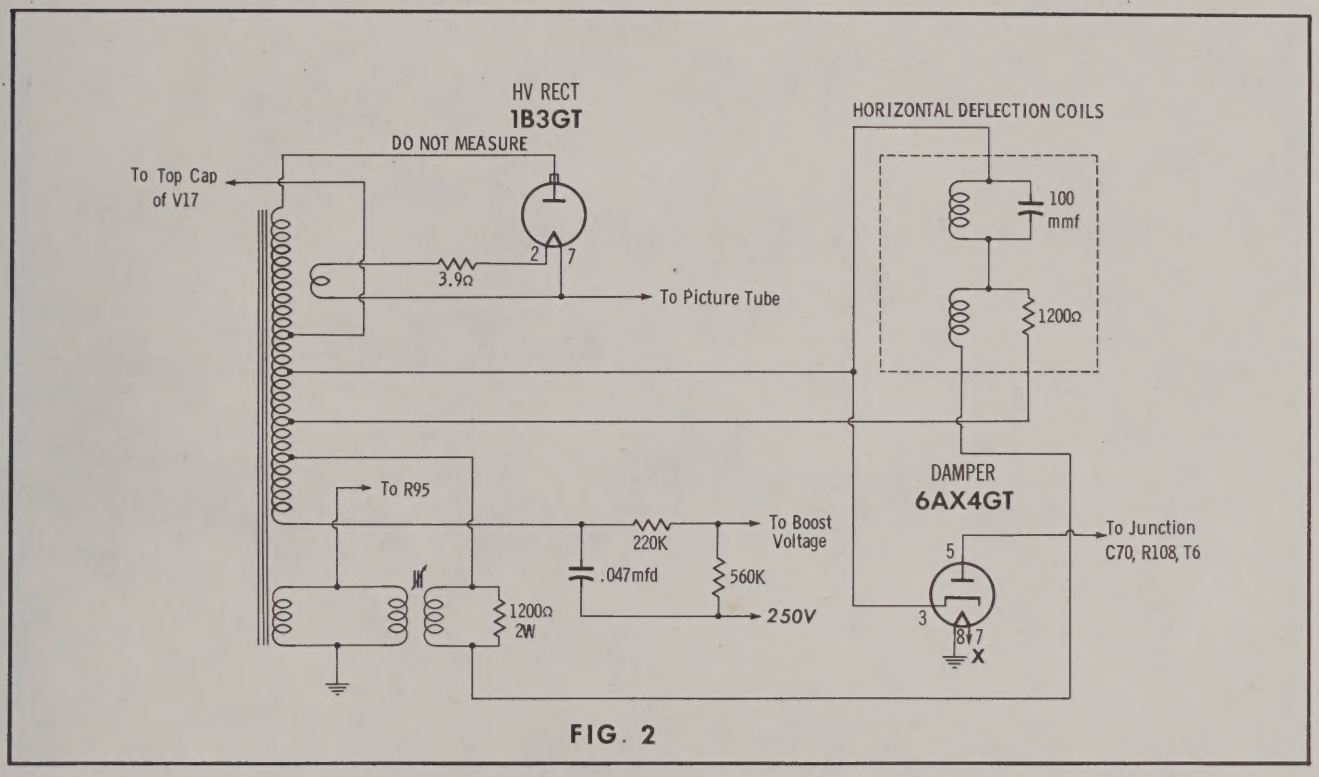

FIG. 2

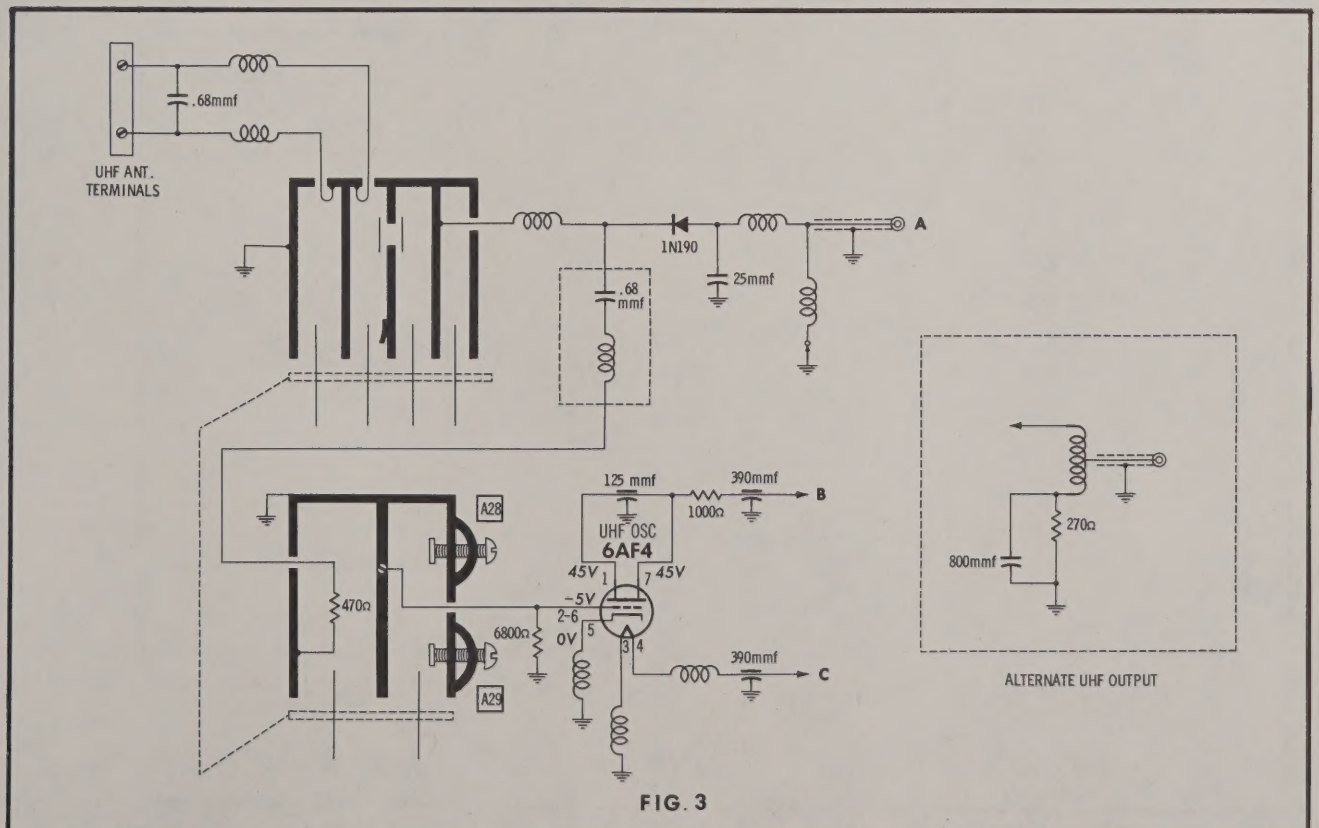

FIG. 3

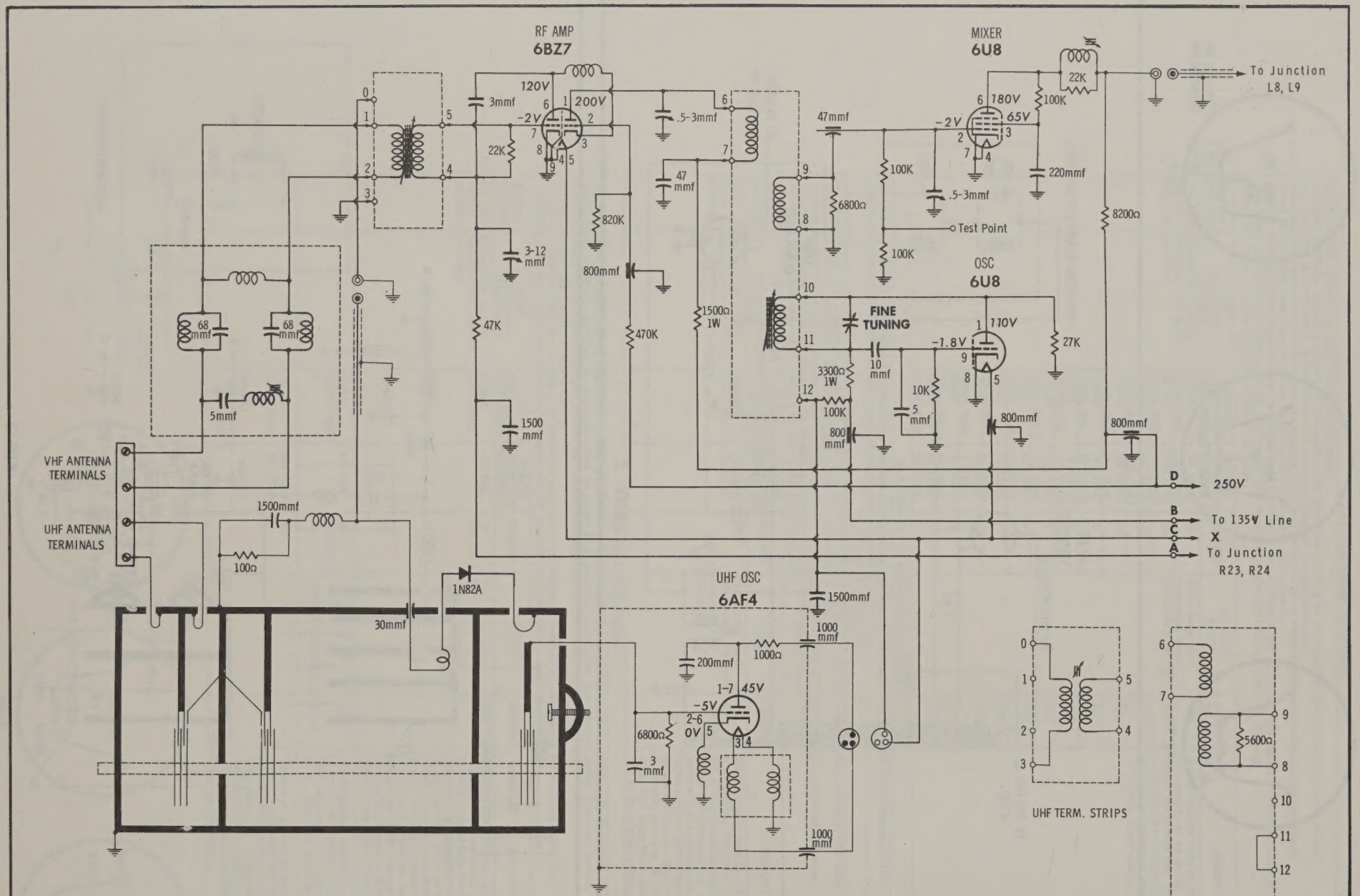
RF AMP
6BZ7
MIXER
6U8
OSC
6U8
UHF OSC
6AF4
FINE TUNING
Test Point
To Junction L8, L9
VHF ANTENNA TERMINALS
UHF ANTENNA TERMINALS
1N82A
250V
To 135V Line
X
To Junction R23, R24
UHF TERM. STRIPS

FIG. 4

ADMIRAL
CHASSIS 5W3

ADMIRAL
CHASSIS 5W3

TRADE NAME	Admiral Model 5B42, 5B43, 5B48, 5W32, 5W33, 5W34, 5W38, 5W39 (Ch. 5W3)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Ill.
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles
RATING	.24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400∿ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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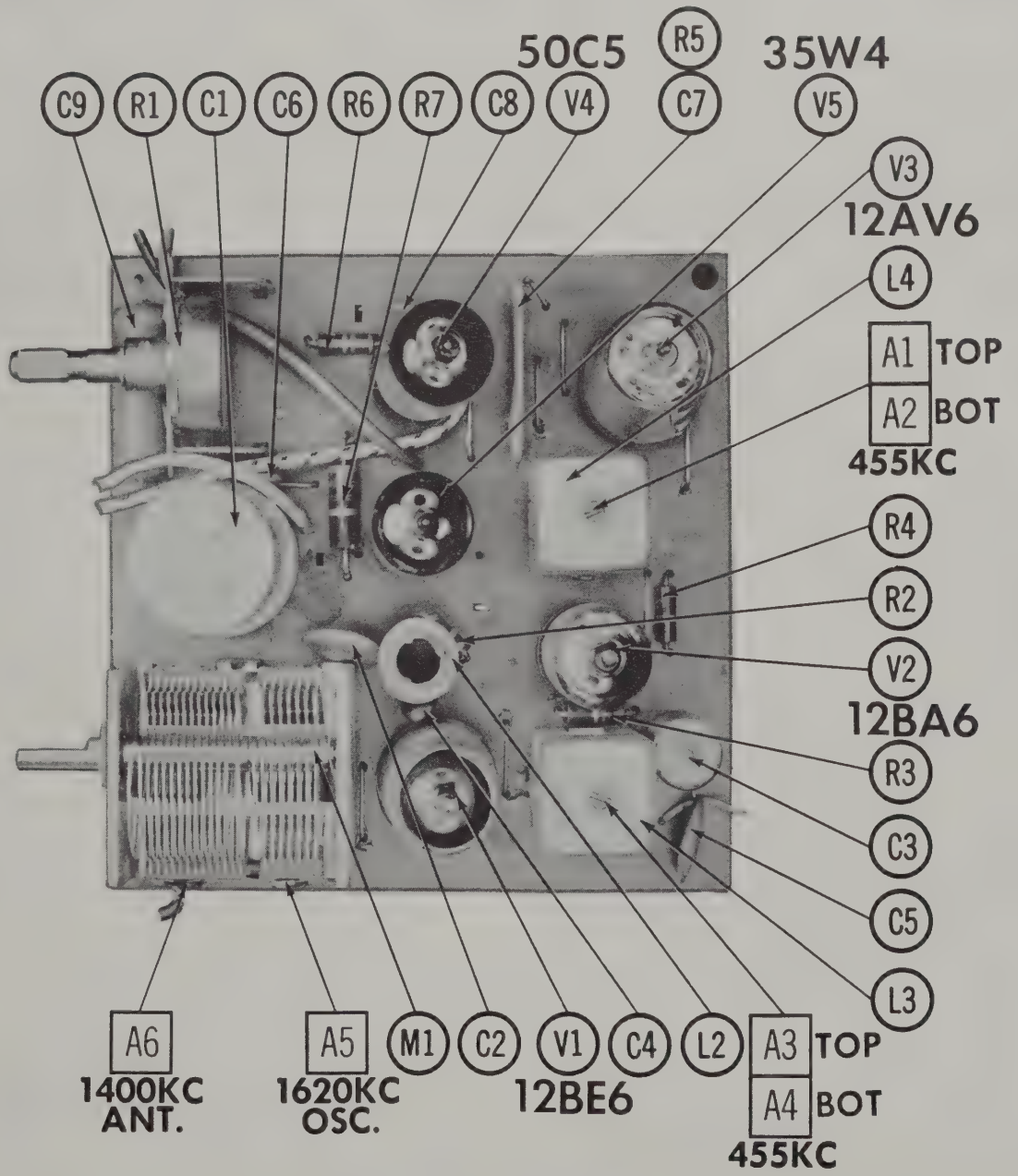


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det-AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■70	150	67C30-2	AFH2-19	XBO181	FP216	TMD-16	D-085	R2202*
B	▲30	150							

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C3	.05	200	64A12-1	BPD-05				PTS415	2SE-S47	
C4	47		65D10-73	N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C5	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C6	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C7A	220		†63B6-14	†PA-113-2	†PC-158	†116TM2	†1408-02		†DT-2	
B	5000									
C	5000									
D	250									
E										
C8	10000		65C10-3	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C9	.047	400	64B17-28	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	

† Items C7A, C7B, C7C, C7D, C7E, R5A, R5B and R5C are combined in one unit. When replacing items separately, C7D and C7E should total 250MMF.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1Meg	½	75C25-2					Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	22K		60B8-223	BTS-22K	
R3	100Ω		60B8-101	BTS-100	
R4	2.2Meg		60B8-225	BTS-2.2Meg	
R5A	6.8Meg			BTS-6.8Meg	
B	470K		†63B6-14	BTS-470K	
C	470K			BTS-470K	
R6	150Ω		60B8-151	BTS-150	
R7	1200Ω	1	60B14-122	BTA-1200	

† Items R5A, R5B, R5C, C7A, C7B, C7C, C7D and C7E are combined in one unit.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2300Ω	3-4Ω	Part of speaker 78B94-1	Z1101 ①	A-3025①	A-3332 ①	26S58 ①	S-12X ①	① Use original channel.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"	PM	3-4Ω	78B94-1	4A07	223S1	

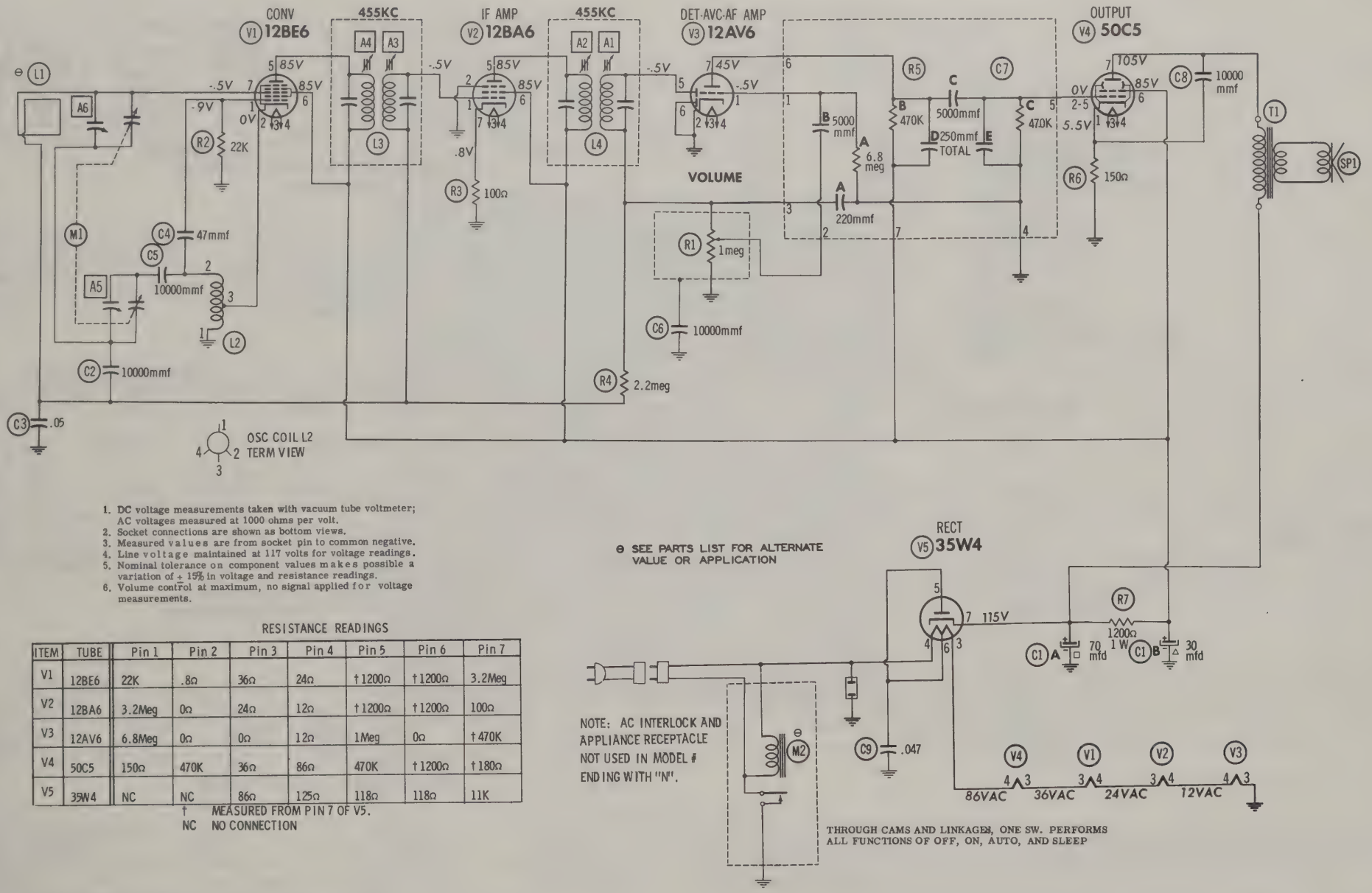
COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Ant.	3.2Ω		A5095				Note 1
L2	Osc. Coil	7.2Ω		69A190-4				Tap② .8Ω. Includes R2, C4.
L3	Input IF	16Ω	16Ω	72C28-65	16-6780	BC-356	13-PC1	
L4	Output IF	16Ω	16Ω	72C28-65	16-6780	BC-357	13-PC2	

Note 1: Part no. A5096 used in models with suffix letter "N".

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M1	Tuning Cap.	68B64-1	2 Gang
M2	Clock	91C15-1	Models 5W34, 5W32, 5W33, 5W38, 5W39
	Clock	91C17-1	Models 5B42, 5B43, 5B48
	Cabinet	34D87-2	Models 5W32, 5B42
	Cabinet	34D87-3	Models 5W33, 5B43
	Cabinet	34D87-4	Model 5W34
	Cabinet	34D87-8	Models 5W38, 5B48
	Cabinet	34D87-9	Model 5W39
	Knob	33C154-4	Tuning, Models 5W32, 5B42
	Knob	33C154-7	Tuning, Models 5W33, 5B43
	Knob	33C154-10	Tuning, Model 5W34
	Knob	33C154-22	Tuning, Models 5W38, 5B48
	Knob	33C154-25	Tuning, Model 5W39
	Knob	33C154-5	On-Off-Volume, Models 5W32, 5B42
	Knob	33C154-8	On-Off-Volume, Models 5W33, 5B43
	Knob	33C154-11	On-Off-Volume, Model 5W34
	Knob	33C154-23	On-Off-Volume, Models 5W38, 5B48
	Knob	33C154-26	On-Off-Volume, Model 5W39
	Knob	33C154-6	Clock, Models 5W32, 5B42
	Knob	33C154-9	Clock, Models 5W33, 5B43
	Knob	33C154-12	Clock, Model 5W34
	Knob	33C154-24	Clock, Models 5W38, 5B48
	Knob	33C154-27	Clock, Model 5W39
	Crystal	24A20	



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.8Ω	36Ω	24Ω	†1200Ω	†1200Ω	3.2Meg
V2	12BA6	3.2Meg	0Ω	24Ω	12Ω	†1200Ω	†1200Ω	100Ω
V3	12AV6	6.8Meg	0Ω	0Ω	12Ω	1Meg	0Ω	†470K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	†1200Ω	†180Ω
V5	35W4	NC	NC	86Ω	125Ω	118Ω	118Ω	11K

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION

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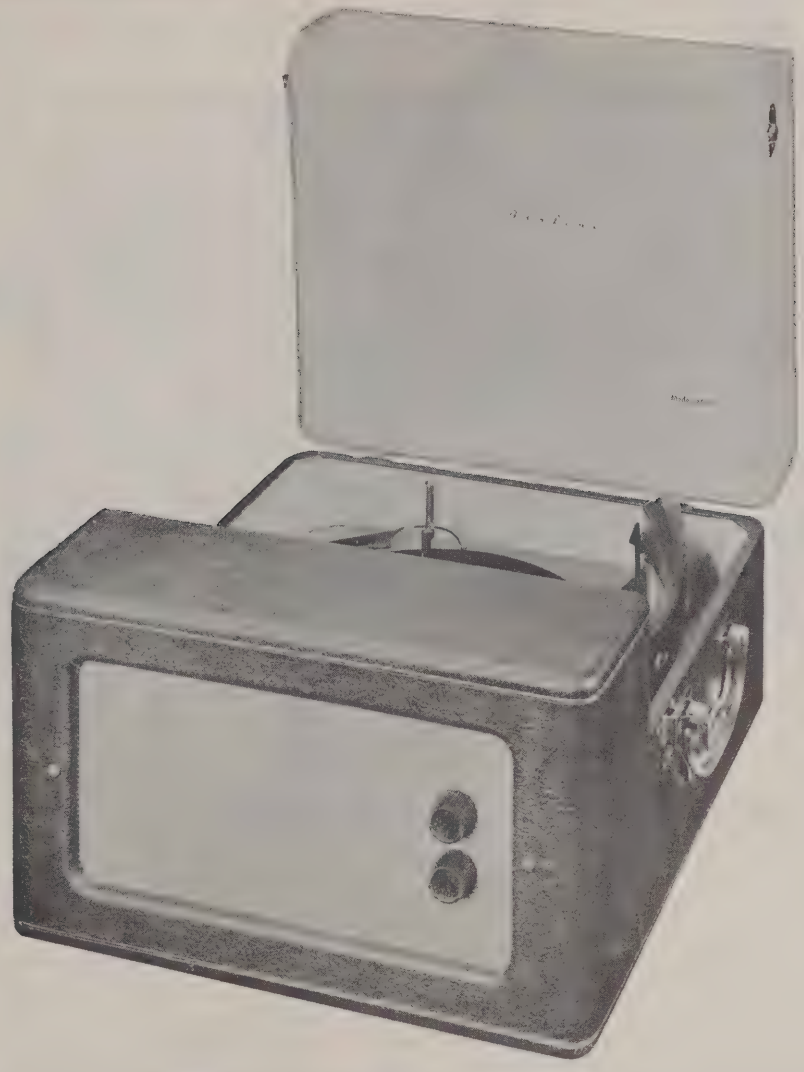
AIRLINE MODELS
45XGAA-978B,C



DENVER, COLORADO

AIRLINE MODELS
45XGAA-978B,C

TRADE NAME	Airline Models 45XGAA-978B, 45XGAA-978C
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AT6 AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .21 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M MODEL 950 - PHOTOFACT SET 216 - FOLDER 11 OR RECORD CHANGER MANUAL CM-5.

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PARTS LIST AND DESCRIPTIONS

AIRLINE
MODEL 45XGAA-978B

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AT6	
V2	Output	50C5	

ITEM No.	USE	TYPE	NOTES
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	1010-A						
B	40	150							
C	20	150							
D	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	330		♦809-B	SI330	D6-331	TP43	GP2K-331	UC-531	5GA-T33	Note 1
C3	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	Note 2
C4	10000		819-B	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C5	1500		821	BPD-0015	D6-152	K071	801-0015	DC5215	5HK-D15	
C6	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	

♦ C2 and R3 are combined in one unit.
Note 1: Not used in some versions.
Note 2: Some versions may use .01MFD in this application. (part #819-B)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	412A	AB-76	A47-2Meg-Z	Q13-139	U-55	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A
R2A	500K	½	408	BSK-60	A47-500K-Z	Q13-133	U-48	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

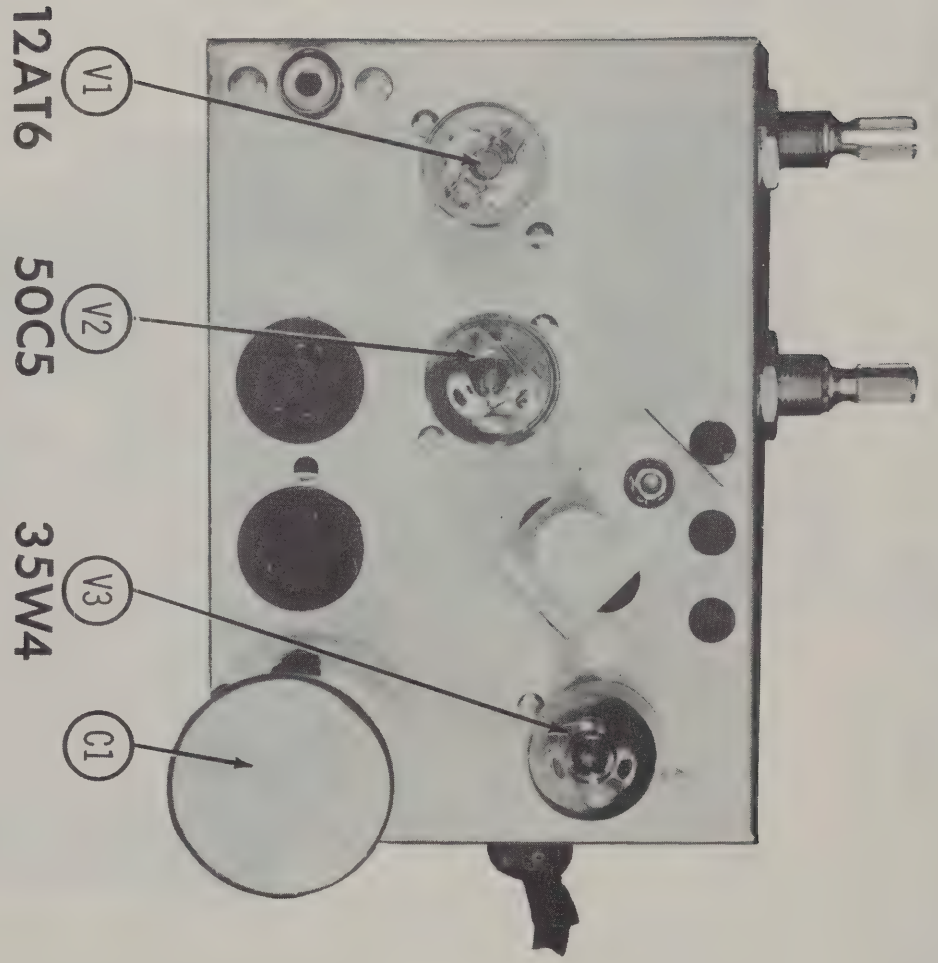
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R3	1Meg		♦809-B	BTS-1Meg	
R4	470K			BTS-470K	
R5	5Meg		525	BTS-4.7Meg	
R6	470Ω		541	BTS-470	
R7	100K			BTS-100K	
R8	470K		502	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R9	150Ω			BTS-150	
R10	1Meg			BTS-1Meg	
R11	1000Ω			BTS-1000	
R12	470Ω	1		BTA-470	Note 1
R13	120Ω	5	625		
R14	50Ω		534	BTS-47	Note 2

♦ Items R3 and C2 are combined in one unit.
Note 1: Some versions use 270Ω 1W in this application.
Note 2: Some versions use 30Ω in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2400Ω	3. 3Ω	Part of speaker.	Z1101	A-3025	A-3332	26S58 ①	S-12X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA: AIRLINE PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	5"	PM	3. 3Ω	2619	5A1	228S1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: AIRLINE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M1	60H31	51-2J	G-AG-J	43	0-2 or S-2	For Model 45XGAA-978B
	60-32	ACD-J	A-1 A-3	96-T	0-1 or S-1 & 0-3	For Model 45XGAA-978C

ASTATIC AND ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

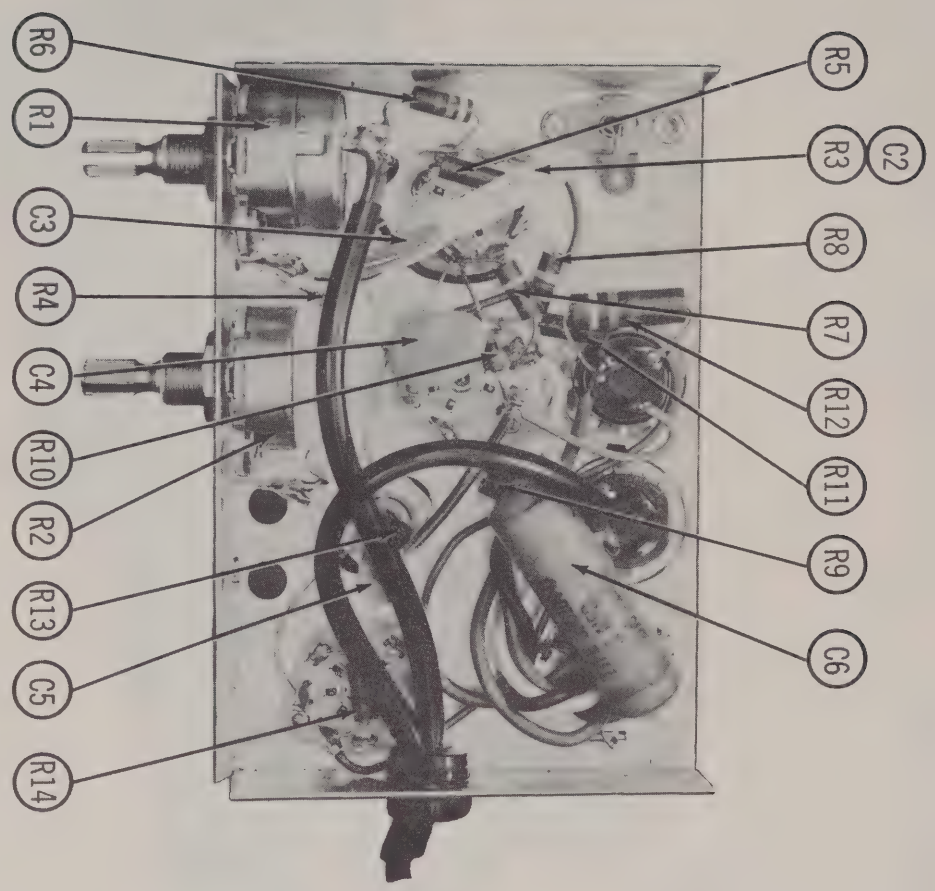
ITEM No.	REPLACEMENT DATA: AIRLINE PART No.	JENSEN PART No.	WALCO PART No.		REMARKS
M2	61H33 (Note 1)	*S-652 or †S-642 or ♦S-642D	*W-3AGA or †W-3AGS		* Metal † Jewel ♦ Diamond
	61H19 (Note 2) (78RPM Needle)	*W-16 or †W-14 or ♦W-14D and	*W-11A or †W-10S or ♦W-10D and		
	61H20 (33 1/3-45RPM Needle)	*W-17 or †W-15 or ♦W-15D	*W-11MGA or †W-10MGS or ♦W-10MGD		

Note 1 - For Model 45XGAA-978B.
Note 2 - For Model 45XGAA-978C.

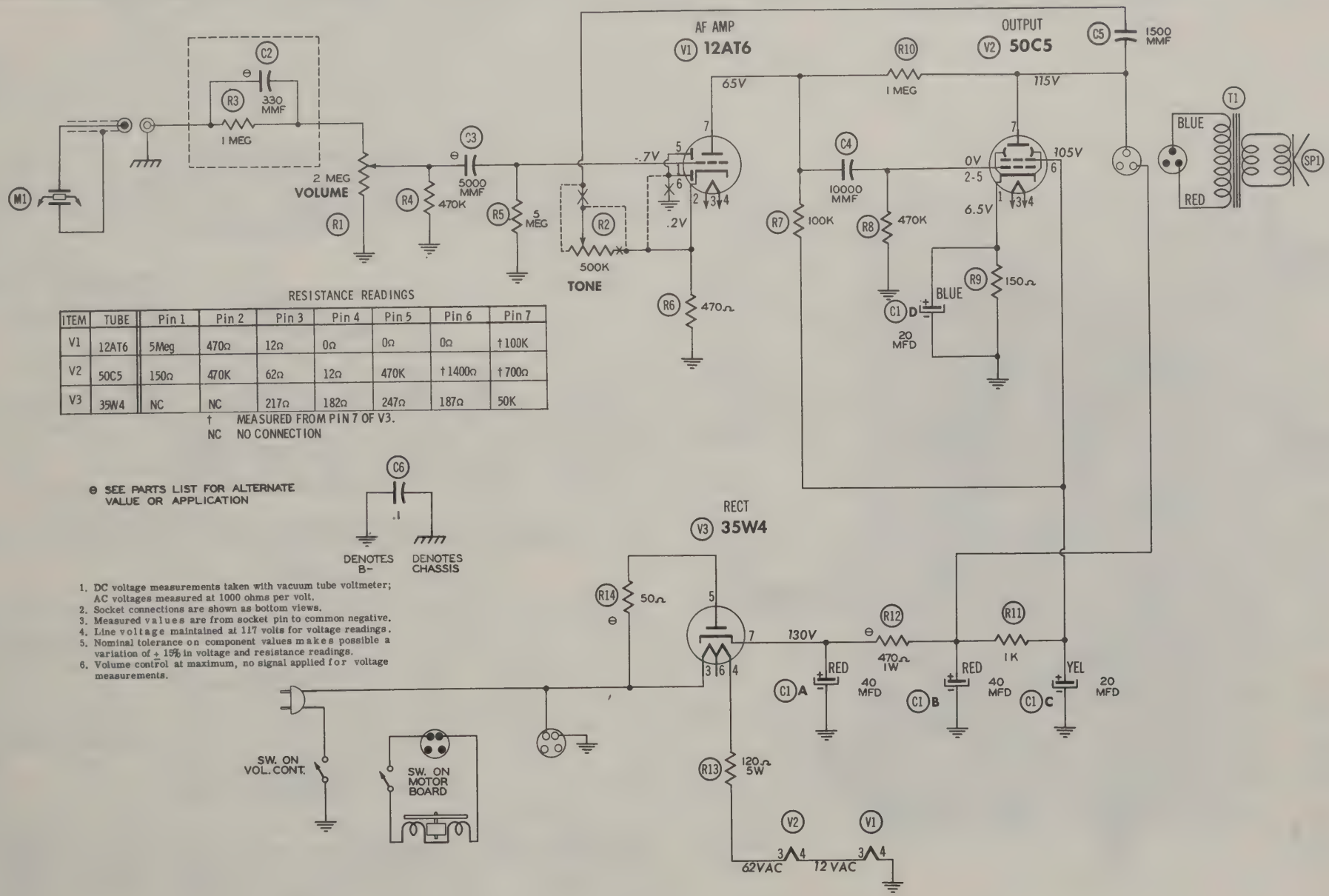
MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
	Carrying Case	2058	
	Knob	2416-B	On-Off-Volume & Tone.

CHASSIS—BOTTOM VIEW



AIRLINE MODEL 45XGAA-978B



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AT6	5Meg	470Ω	12Ω	0Ω	0Ω	0Ω	†100K
V2	50C5	150Ω	470K	62Ω	12Ω	470K	†1400Ω	†700Ω
V3	35W4	NC	NC	217Ω	182Ω	247Ω	187Ω	50K

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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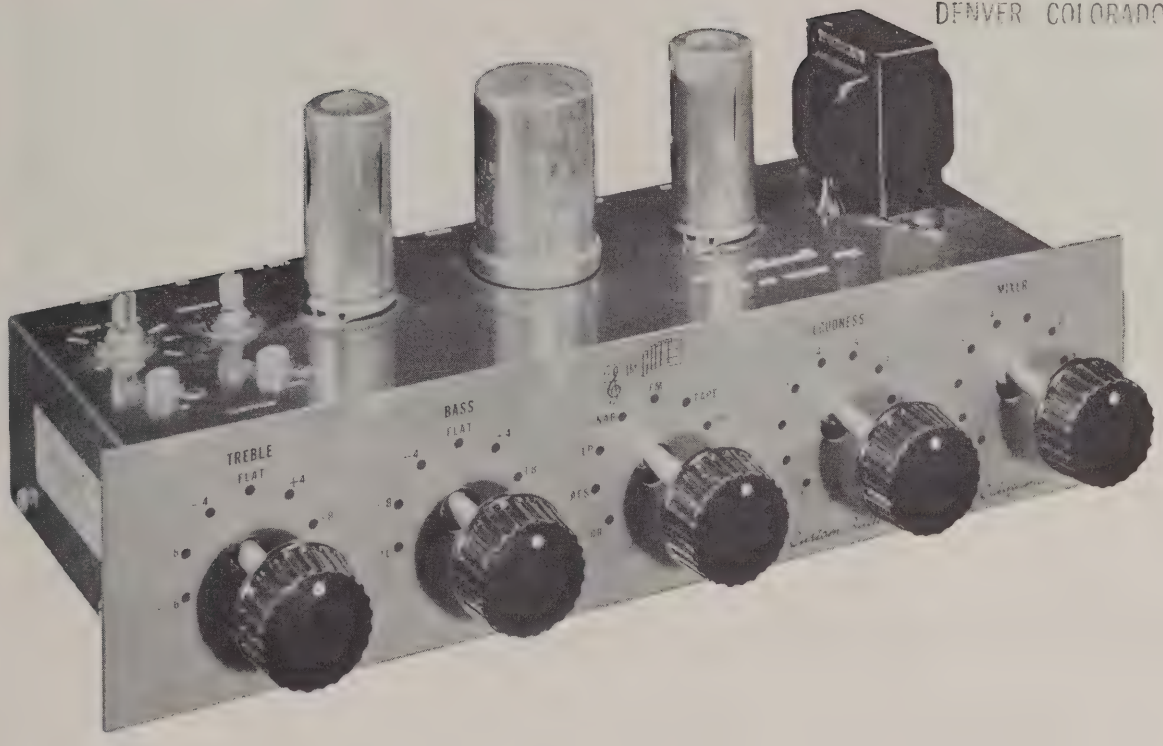
BIGG OF CALIF.
MODEL "George Gott" GP 30P



BIGG OF CALIF.
MODEL "George Gott" GP 30P

TRADE NAME	Bigg of Calif. Model "George Gott" GP 30P
MANUFACTURER	Bigg of California, 2506 W. Washington Blvd., Los Angeles 18, California
TYPE SET	AC Operated Preamplifier
TUBES (Two)	Types 12AX7 Preamplifier, 12AX7 AF Amp.-Cathode Follower
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .15 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

BIGG of CALIF.
MODEL GP 30P

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	12AX7	

ITEM No.	USE	TYPE	NOTES
V2	AF Amp.-Cath. Follower	12AX7	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BIGG PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	400	Note 1	AFH4-11	DO476	FP474.5	TMQ-80	Q-270	TVL-4652
B	■10	350	Note 1				TD-10-450		
C	▲10	200	Note 1						
D	20	25	Note 1						

Note 1. In some versions C1B and C1C are 20MFD. C1D is not used.

FIXED CAPACITORS

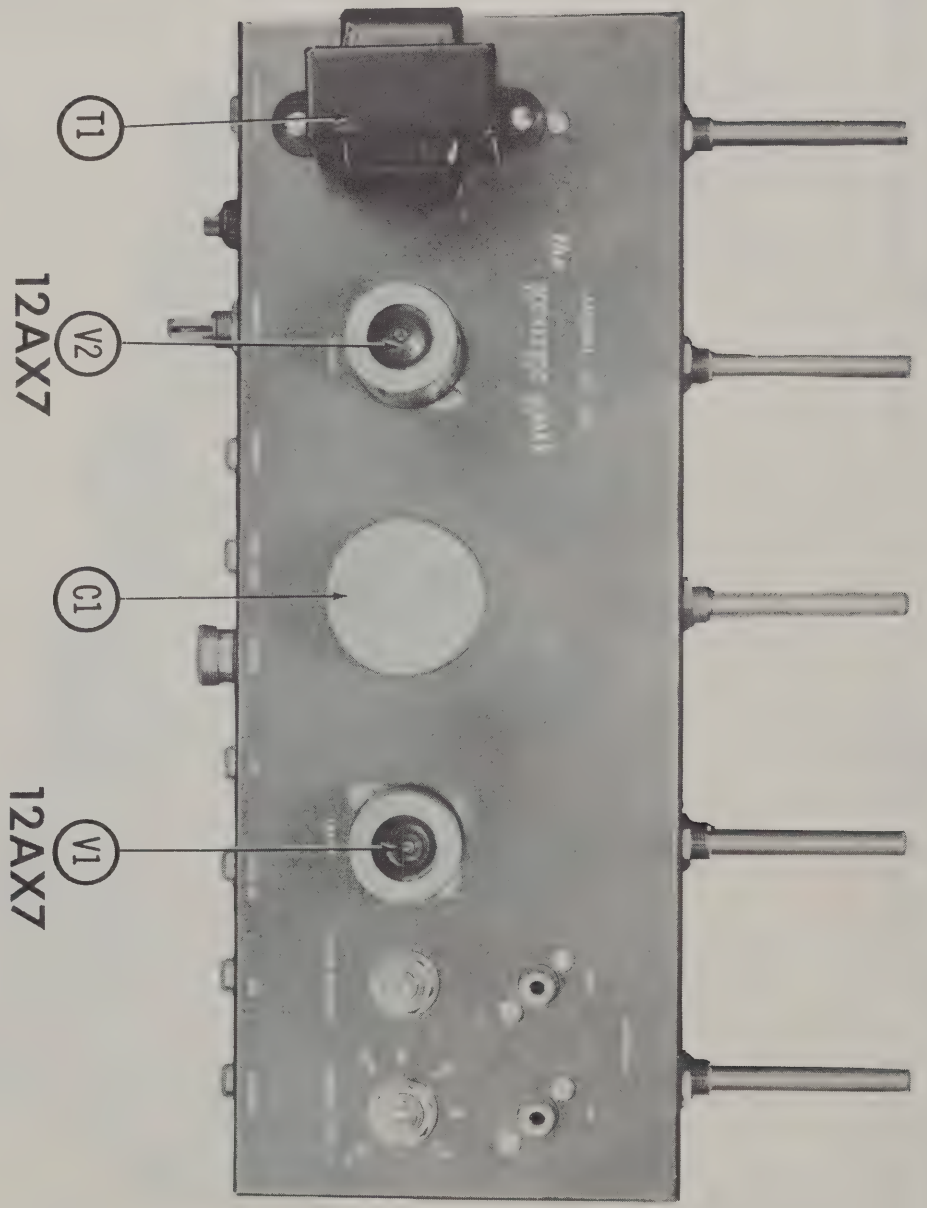
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	BIGG PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	3900	500		SI4000	D6-402	1W5D39	GP2-333-402	MC463	1FM-239	
C3	20000			BPD-02	DD-203	K085	817-02		5HK-S2	
C4	.05	600		BPD-05	DF-503	CUB685		PT615	6TM-S5	
C5	56			SI56	D6-560	TP31	GP1K-560	UC-5456	5GA-Q56	
C6	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C7	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C8	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C9	3900	500		SI4000	D6-402	1W5D39	GP2-333-402	MC463	1FM-239	
C10	3900	500		SI4000	D6-402	1W5D39	GP2-333-402	MC463	1FM-239	
C11	20000			BPD-02	DD-203	K085	817-02		5HK-S2	
C12	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C13	20000			BPD-02	DD-203	K085	817-02		5HK-S2	
C14	20000			BPD-02	DD-203	K085	817-02		5HK-S2	
C15	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C16	20000			BPD-02	DD-203	K085	817-02		5HK-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BIGG PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½		AB-59	A47-500K-S	Q11-133	U50	Treble Control
B	Shaft			AK-9	RS-3	PQ	Not Req.	Attach to R1A
R2A	500K	½		AB-59	A47-500K-S	Q11-133	U50	Bass Control
B	Shaft			AK-9	RS-3	PQ	Not Req.	Attach to R2A
R3A	500K	½		AB-60	A47-500K-Z	Q13-133	U48	Volume Control
B	Shaft			AK-9	RS-3	PQ	Not Req.	Attach to R3A
C	Switch			KB-1	SWE-12	76-1	US-26	Attach to R3A
R4A	1Meg	½		AB-69	A47-1Meg-S	Q11-137	U54	Mixer Control
B	Shaft			AK-9	RS-3	PQ	Not Req.	Attach to R4A
R5A	100K	½		AB-41	A47-100K-Z	Q13-128	U39	Phono Load
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R5A
R6A	100K	½		AB-41	A 47-100K-Z	Q13-128	U39	Hum Balance
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R6A
R7A	250K	½		AB-50	A47-250K-S	Q11-130	U46	Contour Control
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R7A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BIGG PART No.	IRC PART No.	
R8	1800Ω	1		BTA-1800	
R9	270K	1		BTA-270K	
R10	680Ω	1		BTA-680	
R11	3.9Meg	1		BTA-3.9Meg	
R12	100K	1		BTA-100K	
R13	100K	1		BTA-100K	
R14	39K			BTS-39K	
R15	22K			BTS-22K	
R16	22K			BTS-22K	
R17	22K			BTS-22K	
R18	100K			BTS-100K	
R19	100K			BTS-100K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BIGG PART No.	IRC PART No.	
R20	390K	1		BTA-390K	Note 1
R21	100K	1		BTA-100K	
R22	1800Ω	1		BTA-1800	
R23	100K	1		BTA-100K	
R24	100K	1		BTA-100K	
R25	1Meg	1		BTA-1Meg	
R26	1800Ω	1		BTA-1800	
R27	100K	1		BTA-100K	
R28	27K	1		BTA-27K	Note 2
R29	27K	1		BTA-27K	Note 3
R30	47Ω	1		BTA-47	
R31	5.6	1		BW1-5.6	Note 4

Note 1. Some versions use 470K, 1W in this application.
Note 2. Some versions use 22K, 1W in this application.
Note 3. Some versions use 33K, 1W in this application.
Note 4. Some versions use 4.7Ω, 1W in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	BIGG PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.15A	120VAC @.015A	6.3VAC @.44A		T26R32	P9100	P-3046	PS-8415	26R32	

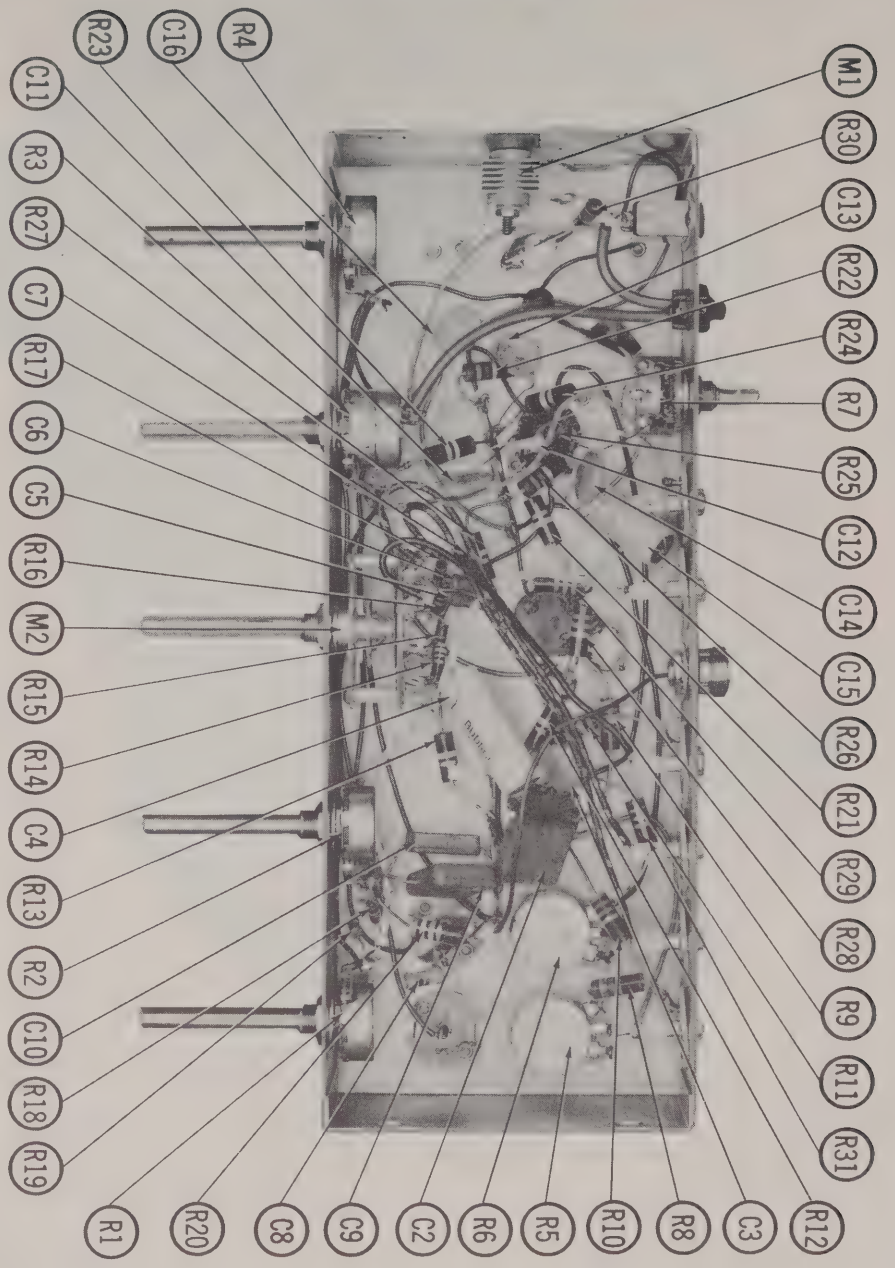
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	BIGG PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.015A		1002A	RS050	8S35	8J1	50	

MISCELLANEOUS

ITEM No.	PART NAME	BIGG PART No.	NOTES
M2	Switch		Selector and record compensation (SP-11 position, rotary, wafer type)

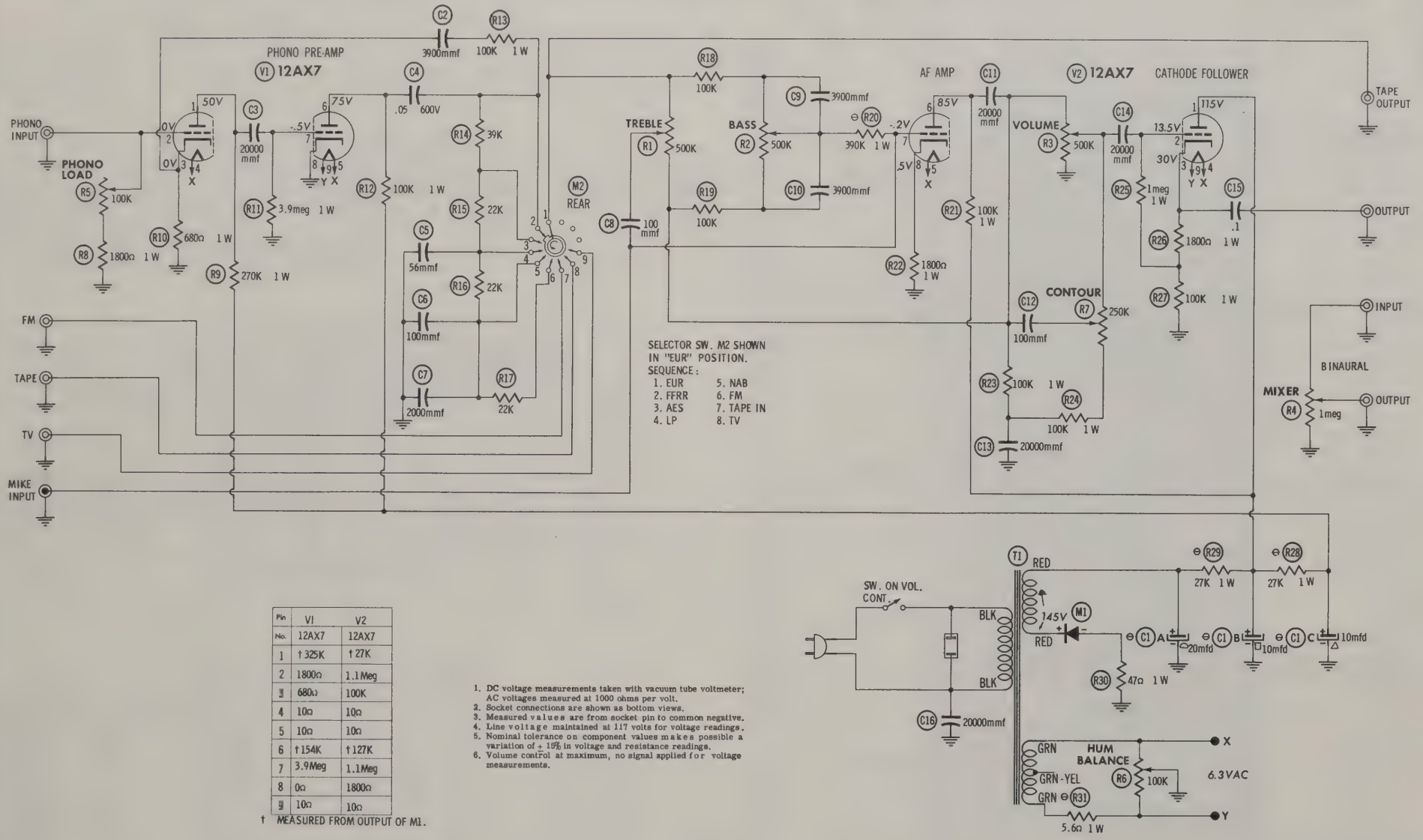
CHASSIS—BOTTOM VIEW



SET 341 FOLDER 4

BIGG of CALIF. MODEL GP 30P

BIGG of CALIF. MODEL GP 30P



Pin No.	V1	V2
1	†325K	†27K
2	1800Ω	1.1Meg
3	680Ω	100K
4	10Ω	10Ω
5	10Ω	10Ω
6	†154K	†127K
7	3.9Meg	1.1Meg
8	0Ω	1800Ω
9	10Ω	10Ω

† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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PROPERTY OF
L. F. BLANK
3924 MEADE ST.
DENVER, COLORADO

CONTINENTAL
MODEL 738.44

TRADE NAME	Continental Model 738.44
SUPPLIER	Spiegel Inc., 1061 W. 35th. St., Chicago 9, Ill.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Four)	Types 12AU6 Converter, 12AV6 Det.-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-125 Volts AC-DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC-1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna lug on tuning gang. Low side to B-.	455KC (400%Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1630KC	"	"	A3	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

CONTINENTAL MODEL 738.44

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12AU6	
V2	Det.-AF Amplifier	12AV6	

ITEM No.	USE	TYPE	NOTES
V3	Output	50C5	
V4	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Continental PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150		PRS150/25V40 40/20	BBRT4415C	TCT3116	TDLT-13	FMT-327	TVA-3430
B	40	150							
C	25	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Continental PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C3	250			SI250	D6-251	TP40	GP2K-251	UC-5325	5GA-T25	
C4	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C5	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C6	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C7	.02	400		BPD-02	DF-203	CUB4S2	817-02	PT412	4TM-S2	
C8	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Continental PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	300K	½	C-4407	AB-60	A47-250K-Z	Q13-132	U48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A

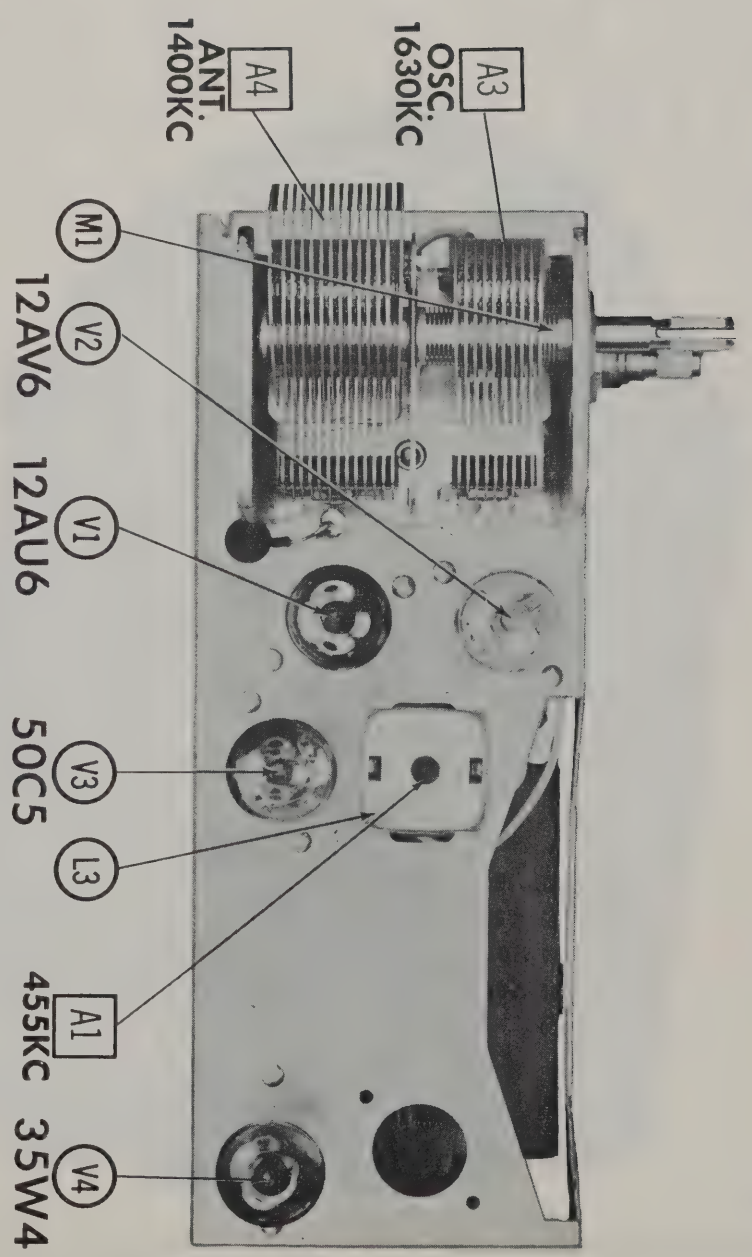
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Continental PART No.	IRC PART No.	
R2	2Meg			BTS-2.2Meg	
R3	6.8Meg			BTS-6.8Meg	
R4	330K			BTS-330K	
R5	470K			BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Continental PART No.	IRC PART No.	
R6	150Ω			BTS-150	
R7	2200Ω			BTS-2200	
R8	47Ω	1		BTA-47	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Continental PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2750Ω	3-4Ω		Z1001	A-3031 ①	A-3876	22S45	S-1X	① Drill new mounting holes. Tape hum bucking tap.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Continental PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω		4A07	223S1	

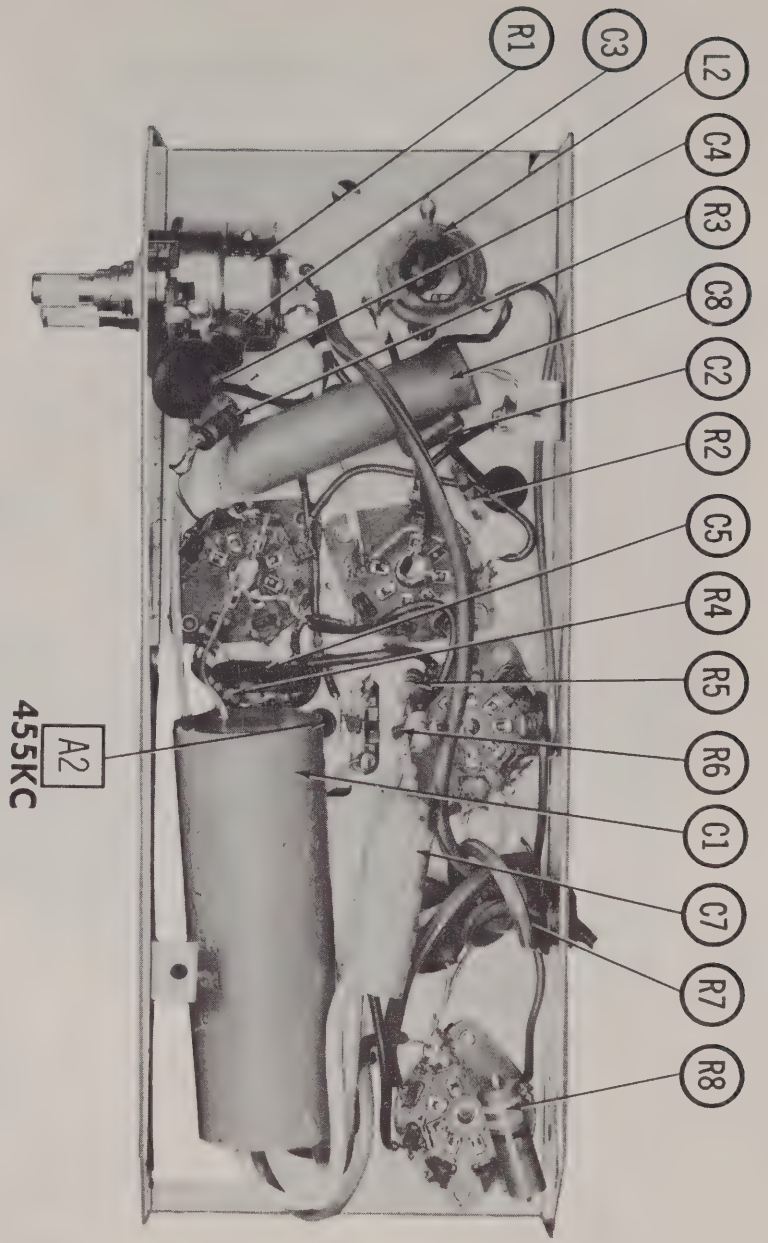
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Continental PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	.4Ω		C-4414				
L2	Osc. Coil	1.5Ω	6Ω					Tertiary winding -2.9Ω
L3	IF Trans.	30Ω*	28Ω	C-4403				* Tapped @ 1.1Ω

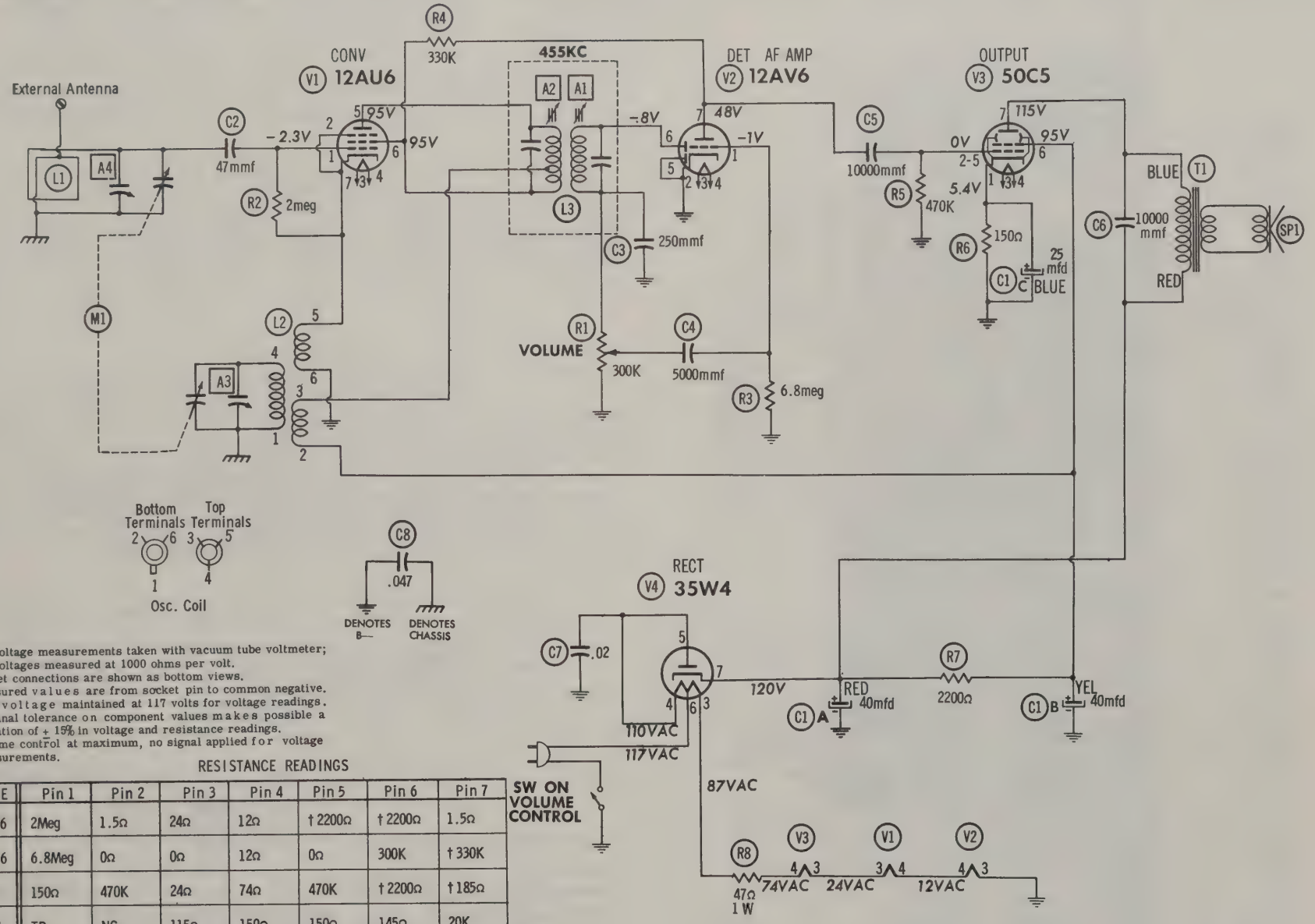
MISCELLANEOUS

ITEM No.	PART NAME	Continental PART No.	NOTES
M1	Tuning Cap.	C-4402-1	2 Gang (40-495MMF, 21-190MMF)

CHASSIS—BOTTOM VIEW



CONTINENTAL MODEL 738.44



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	2Meg	1.5Ω	24Ω	12Ω	†2200Ω	†2200Ω	1.5Ω
V2	12AV6	6.8Meg	0Ω	0Ω	12Ω	0Ω	300K	†330K
V3	50C5	150Ω	470K	24Ω	74Ω	470K	†2200Ω	†185Ω
V4	35W4	TP	NC	115Ω	150Ω	150Ω	145Ω	20K

† MEASURED FROM PIN 7 OF V4.
TP TIE POINT
NC NO CONNECTION.

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PROPERTY OF
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3934 W. 44th Ave.
DENVER, COLORADO

CROSLEY MODELS T-41BK,
GN, GY, IY, RD (Ch. 41T)

CROSLEY MODELS T-41BK,
GN, GY, IY, RD (Ch. 41T)

TRADE NAME	Crosley Models T-41BK, T-41GN, T-41GY, T-41IY, T-41RD (Ch. 41T)
MANUFACTURER	Crosley Corp., 1329 Arlington St., Cincinnati, Ohio
TYPE SET	AC-DC Operated AM Receiver
TUBES (Five)	Types 12BE6 Converter, 12BD6 IF Amplifier, 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Fig. 1	Thru dummy to pin 7 (grid) of V1. Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A6	"

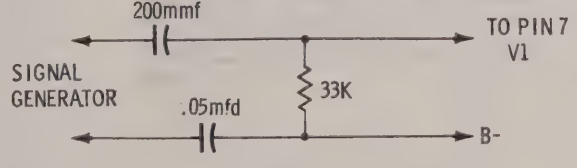

Fig. 1

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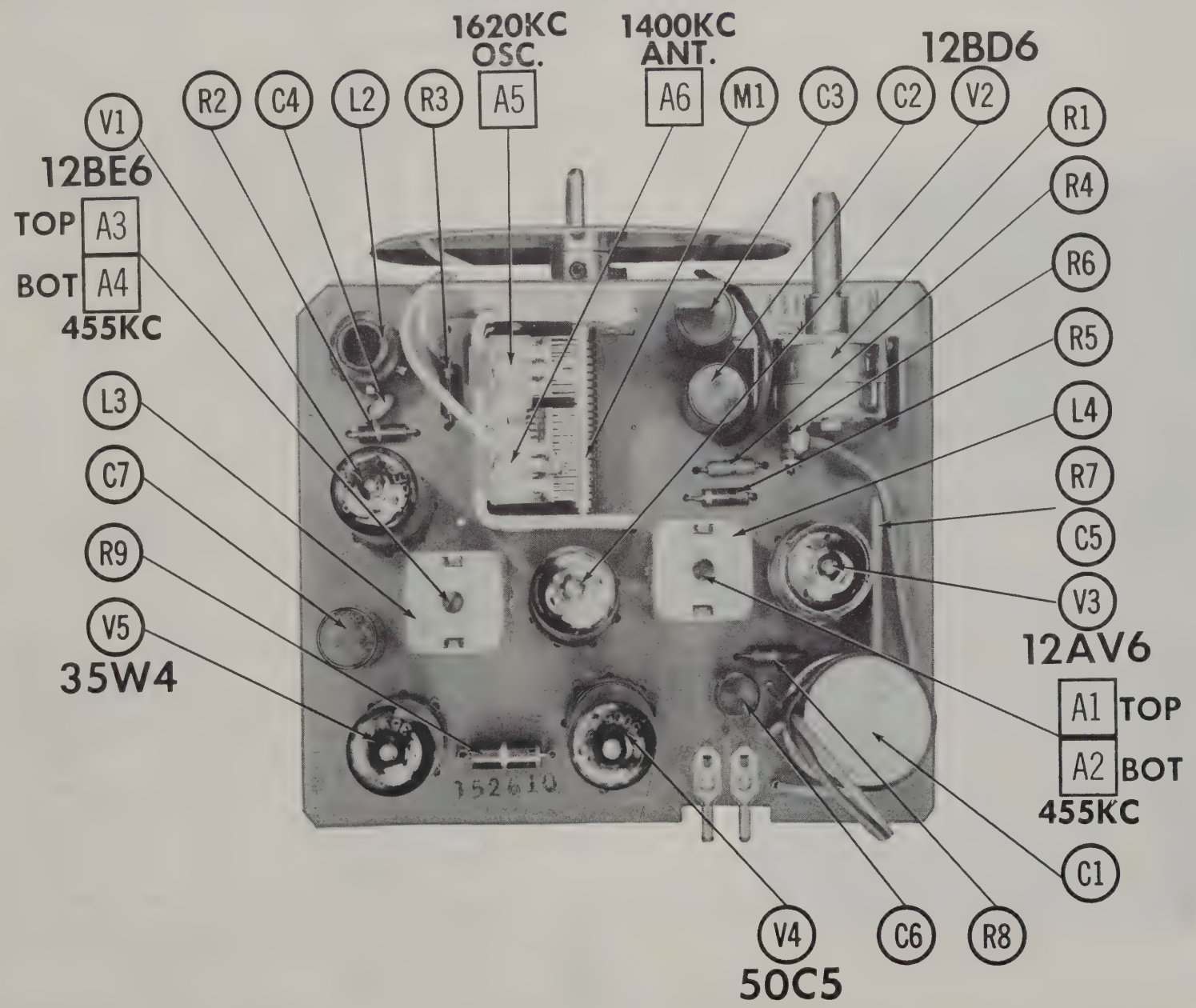


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BD6	
V3	Det-AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA CROSLEY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	159348-1	AFH2-15	B0150	FP213	TMD-12	D-065	TVL-2432
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA CROSLEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.068	200							2SE-S68	
C3	.068	400	159505-5						4SE-S68	
C4	39		170194-8							
C5A	220									
B	2000									
C	5000		†158110-3	†PA-511	†PCT-157				†DT-4	
D	250									
E										
C6	.022	200	159505-1						2SE-S22	
C7	.047	200	159505-2					PTS4147	4SE-S47	

† Items C5A, C5B, C5C, C5D, C5E, R7A, R7B and R7C are combined in one unit. When replacing items separately, C5D and C5E should total 250MMF.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA CROSLEY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500K	½	C171610-1-1					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CROSLEY PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	22K		39374-41	BTS-22K	
R3	10Ω		39374-1	BTS-10	
R4	2.2Meg		39374-69	BTS-2.2Meg	
R5	100Ω		39374-13	BTS-100	
R6	47K		39374-45	BTS-47K	
R7A	6.8Meg		†158110-3	BTS-6.8Meg	
B	470K			BTS-470K	
C	470K			BTS-470K	
R8	150Ω		39374-15	BTS-150	
R9	1200Ω	1	39374-114	BTA-1200	

† Items R7A, R7B, R7C, C5A, C5B, C5C, C5D and C5E are combined in one unit.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA CROSLEY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2600Ω	3-4Ω	170933-1	Z1101 ①	A-3025 ①	A-3332 ①	26S58 ②	C-12X ①	① Use original channel. ② Drill new mtg. holes.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA CROSLEY PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"	PM	3-4Ω	170797-1	4A07	223S1	

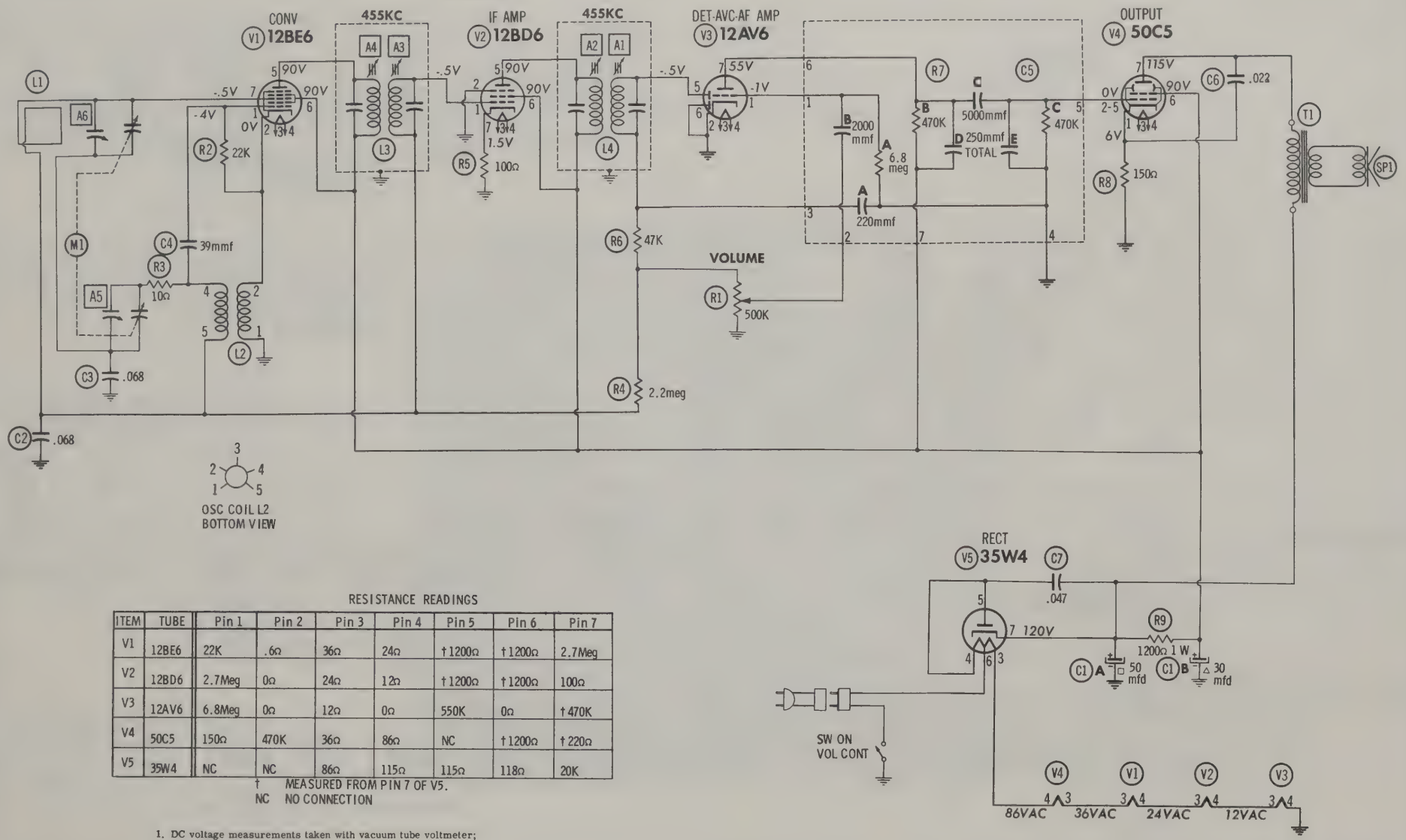
COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CROSLEY PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Ant.	2.9Ω		170923-1				Includes cabinet back.
L2	Osc. Coil	.6Ω	11Ω	159517-1				
L3	Input IF	17Ω	17Ω	170358-1				
L4	Output IF	17Ω	17Ω	170358-1				

MISCELLANEOUS

ITEM No.	PART NAME	CROSLEY PART No.	NOTES
M1	Tuning Cap.	171605-1	2 Gang
	Cabinet	171949-1	Model T41IY
	Cabinet	171949-2	Model T41GN
	Cabinet	171949-3	Model T41RD
	Cabinet	171949-4	Model T41GY
	Cabinet	171949-5	Model T41BK
	Knob	171646-1	2 Used, Model T41IY
	Knob	171646-2	2 Used, Model T41GN
	Knob	171646-3	2 Used, Model T41RD
	Knob	171646-4	2 Used, Model T41GY
	Knob	171646-5	2 Used, Model T41BK
	Dial Window	171584-1	

CROSLEY MODEL T-41BK (Ch. 41T)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.6Ω	36Ω	24Ω	†1200Ω	†1200Ω	2.7Meg
V2	12BD6	2.7Meg	0Ω	24Ω	12Ω	†1200Ω	†1200Ω	100Ω
V3	12AV6	6.8Meg	0Ω	12Ω	0Ω	550K	0Ω	†470K
V4	50C5	150Ω	470K	36Ω	86Ω	NC	†1200Ω	†220Ω
V5	35W4	NC	NC	86Ω	115Ω	115Ω	118Ω	20K

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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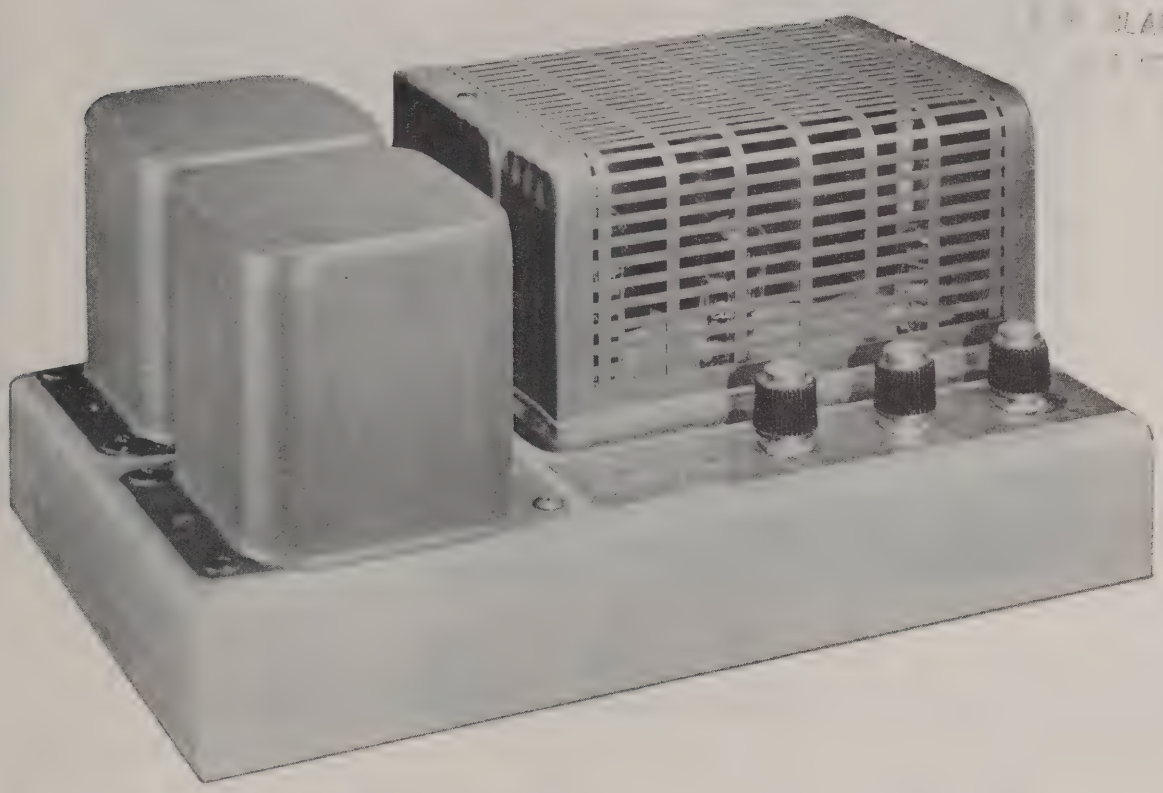

ELECTRO-VOICE
MODEL A15

TRADE NAME	Electro-Voice Model A15
MANUFACTURER	Electro-Voice, Inc., Buchanan, Mich.
TYPE SET	AC Operated Amplifier
TUBES (Six)	Types 12AX7 AF Amp.-Phase Inv., 12BH7A Driver , (2) EL84 Output, (2) 6X4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .48 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

ELECTRO-VOICE
MODEL A15

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp.-Phase Inv.	12AX7	
V2	Driver	12BH7A	
V3	Output	EL84	

ITEM No.	USE	TYPE	NOTES
V4	Output	EL84	
V5	Rectifier	6X4	
V6	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Electro-Voice PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▰40	400	4208	AFH2-57	B0450	FP238	TMD-43	D-185	TVL-2764
B	▲40	400							
C2A	▲40	400	4208	AFH2-57	B0450	FP238	TMD-43	D-185	TVL-2764
B	▰40	400							
C3	20	400	4207	AFH1-45	A0460	FP144	TMS-50	S-260	TVL-1660
C4	50	100	4242	PRS150V50	BR5015	TC49	TD-50-150	FM-1550	TVA-1414

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA								NOTES
	CAP.	VOLT	Electro-Voice PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.		
C5	.1	200	4265	P288N-1	DF-104	CUB2P1		PT401	2TM-P1		
C6	100		4281	BPD-0001	DD-101	G042	831-101	UC-531	5GA-T1		
C7	.022	400	4260	BPD-02	DD-203	CUB4S22	817-02	PT4122	4TM-S22		
C8	.047	400	4243	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47		
C9	.047	400	4243	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47		
C10	10000		4257	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1		
C11	.1	600	4241	P688N-1	DF-104	CUB6P1		PT601	6TM-P1		
C12	.1	600	4241	P688N-1	DF-104	CUB6P1		PT601	6TM-P1		
C13	.047	400	4243	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47		
C14	.047	400	4243	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47		

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Electro-Voice PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	250K	½	J4686	B-51	A47-250K-Z	Q13-130	U44	Level
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	1Ω	2	K4686					Damping Factor-wire wound
B	1800Ω	2						Damping Factor- wire wound

RESISTORS

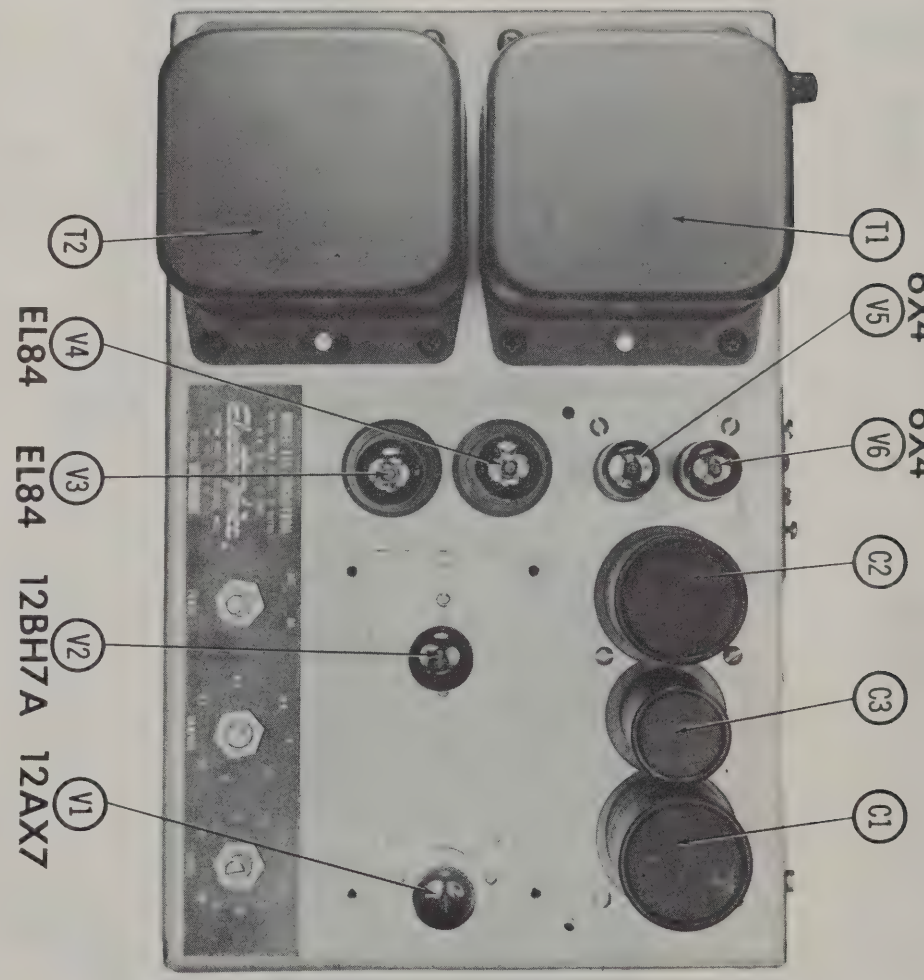
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Electro-Voice PART No.	IRC PART No.	
R3	270K		4669	BTS-270K	
R4	22K		4651	BTS-22K	
R5	1.2Meg		4656	BTS-1.2Meg	
R6	27K		4651	BTS-27K	
R7	470Ω		4654	BTS-470	
R8	27K		4651	BTS-27K	
R9	470K		4650	BTS-470K	
R10	470K		4650	BTS-470K	
R11	470K		4650	BTS-470K	Note 1
R12	12K	2	4679	BTB-12K	
R13	12K	2	4679	BTS-12K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Electro-Voice PART No.	IRC PART No.	
R14	1200Ω		4658	BTS-1200	
R15	120Ω		4607	BTS-120	
R16	470K		4650	BTS-470K	
R17	470K		4650	BTS-470K	
R18	120Ω		4607	BTS-120	
R19	47K		4668	BTS-47K	
R20	1800Ω			BTS-1800	Note 2
R21	56K		4652	BTS-56K	
R22	56K		4652	BTS-56K	
R23	100Ω	2	4655	BTB-100	
R24	100Ω	2	4655	BTB-100	

Note 1. Not used in some versions.
Note 2. Some versions use 3300Ω in this application (Part #46017).

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .48A	550VCT @ .024A	550VCT @ .025A	6.3VAC @ 3.6A SEC. 4 20V *	1591					

* Bias Supply.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2000Ω	16Ω tap @ 8Ω,4Ω	1590						

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Electro-Voice PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	1½A 125V	20171		31301.5 (3AG S/B 1½A)	342001	MDX 1½	HKP

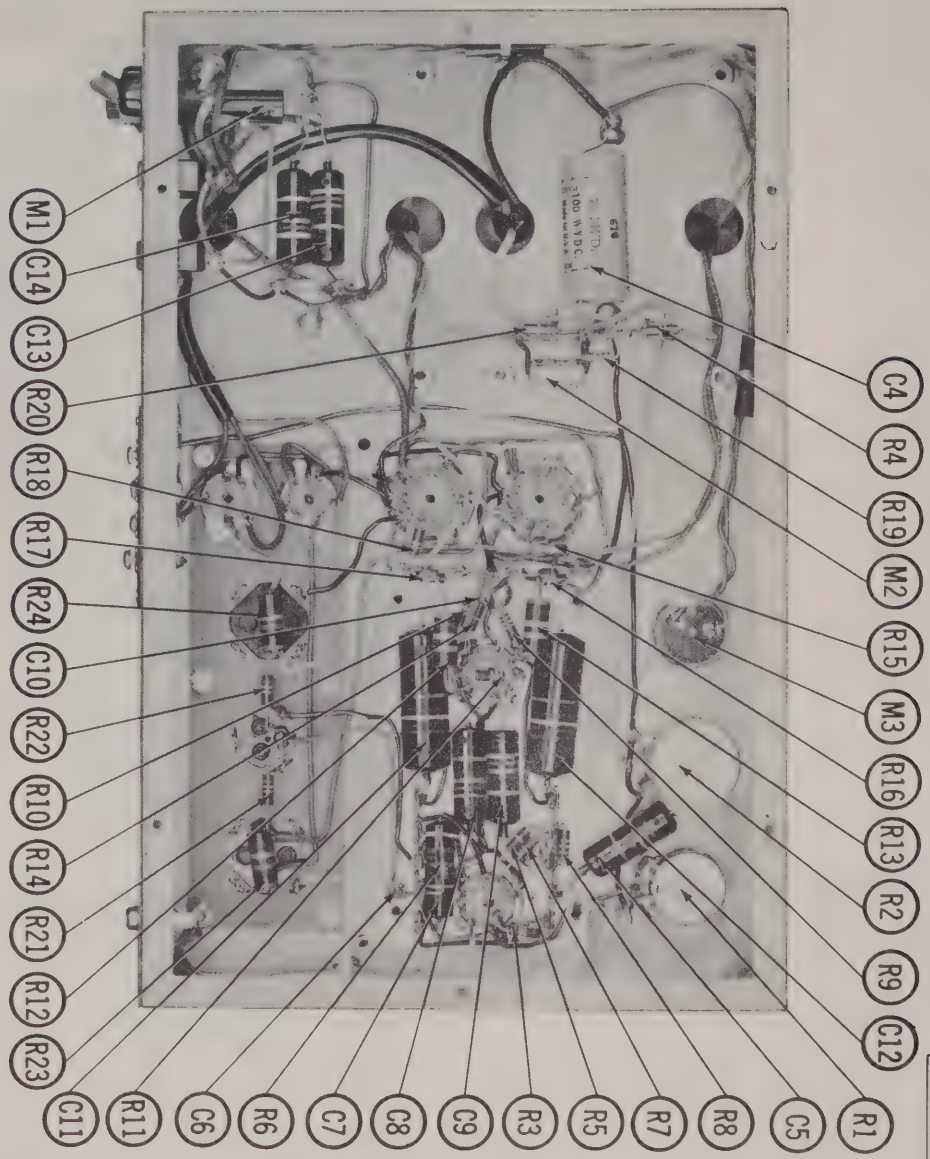
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Electro-Voice PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M2		5914	1159	CR10	8820		10	

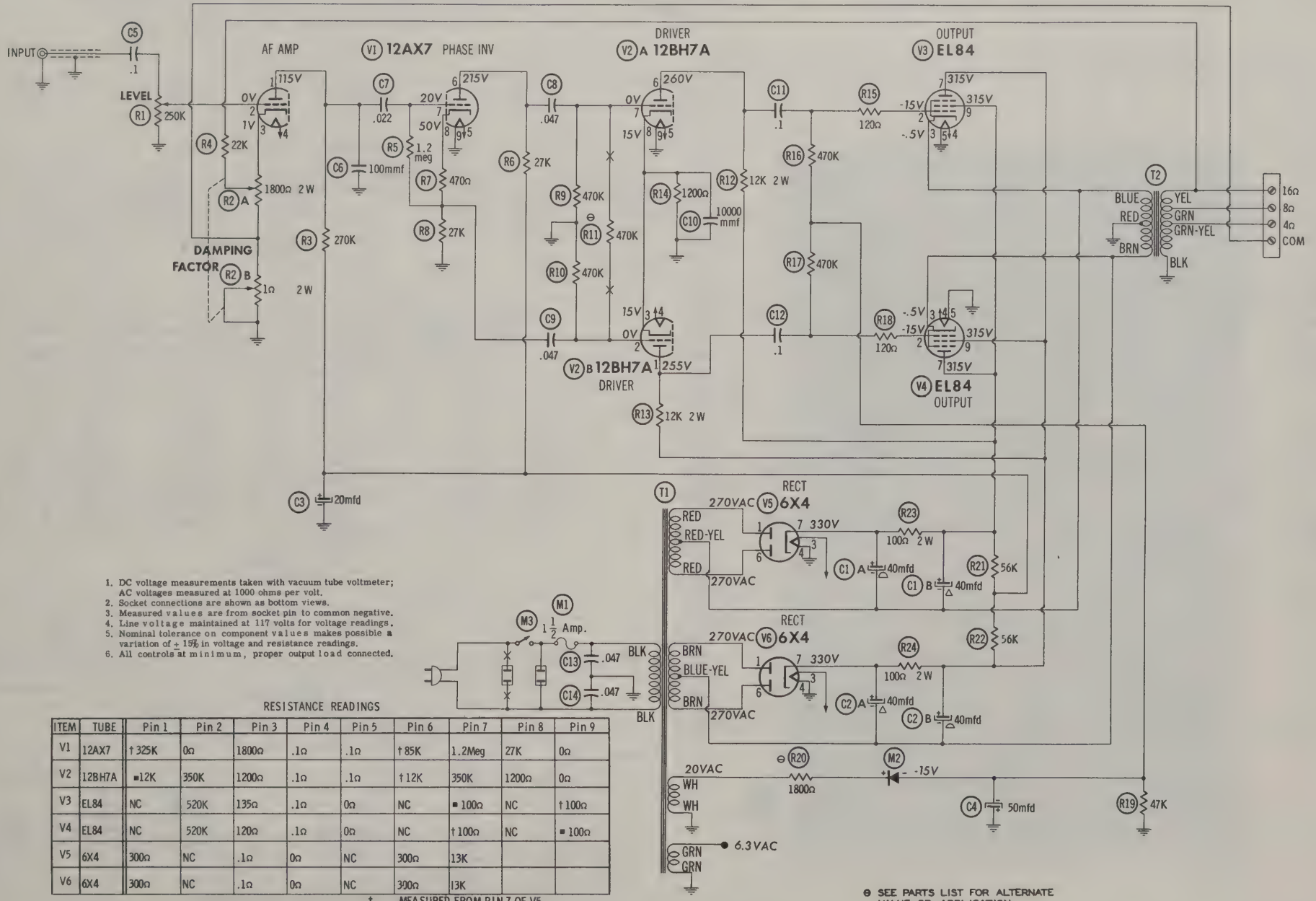
MISCELLANEOUS

ITEM No.	PART NAME	Electro-Voice PART No.	NOTES
M3	Switch	B5641	On-off (Power) SPST

CHASSIS—BOTTOM VIEW



ELECTRO-VOICE MODEL A15



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†325K	0Ω	1800Ω	.1Ω	.1Ω	†85K	1.2Meg	27K	0Ω
V2	12BH7A	▪12K	350K	1200Ω	.1Ω	.1Ω	†12K	350K	1200Ω	0Ω
V3	EL84	NC	520K	135Ω	.1Ω	0Ω	NC	▪100Ω	NC	†100Ω
V4	EL84	NC	520K	120Ω	.1Ω	0Ω	NC	†100Ω	NC	▪100Ω
V5	6X4	300Ω	NC	.1Ω	0Ω	NC	300Ω	13K		
V6	6X4	300Ω	NC	.1Ω	0Ω	NC	300Ω	13K		

† MEASURED FROM PIN 7 OF V5.
▪ MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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RETMA MEMBER

MAGNAVOX
CHASSIS AMP-149

PROPERTY OF
L. F. BLANKENSHIP
3824 M[illegible] ST.
DENVER, COLORADO

MAGNAVOX
CHASSIS AMP-149

MAGNAVOX
CHASSIS AMP-149

TRADE NAME	Magnavox Chassis AMP-149
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne, Indiana
TYPE SET	AC Operated Amplifier
TUBES (Seven)	Types 6C4 AF Amplifier, (4) 6V6GT Output, (2) 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC - 50/60 Cycles RATING . 93 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

MAGNAVOX
CHASSIS AMP-149

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	6C4	
V2	Output	6V6GT	
V3	Output	6V6GT	
V4	Output	6V6GT	

ITEM No.	USE	TYPE	NOTES
V5	Output	6V6GT	
V6	Rectifier	5Y3GT	
V7	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■30	475	270023-2	AFH2-52	B0410	FP259	TMD-51	T-135	TVL-3778
B	▲10	475							
C2A	■30	475	270023-2	AFH2-52	B0410	FP259	TMD-51	T-135	TVL-3778
B	▲10	475							
C3	20	25	270027-2	PRS25V25	BR202	TC26	TD-25-25	FM-0225	TVA-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	.1	600	250201-13	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C5	15	500	250187-43	NP0-DI15	D6-150	22R5Q15	831-150		MS-415	
C6	.01	600	250201-7	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C7	15	500	250187-43	NP0-DI15	D6-150	22R5Q15	831-150		MS-415	
C8	.022	600	250201-9	BPD-02	DF-203	CUB6S22	817-02	PT6122	6TM-S22	
C9	.022	600	250201-9	BPD-02	DF-203	CUB6S22	817-02	PT6122	6TM-S22	
C10	.015	600	250201-8	BPD-015	DD16-153	CUB6S15	821-015	PT6115	6TM-S15	
C11	.01	600	250201-7	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C12	10000	1000	250219-2	P1088N-01	DD16-103	CUB16S1		PT1611	10TM-S1	
C13	10000	1000	250219-2	P1088N-01	DD16-103	CUB16S1		PT1611	10TM-S1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAGNAVOX PART No.	IRC PART No.	
R1	220K		230104-90	BTS-220K	
R2	47K		230104-82	BTS-47K	
R3	3300Ω		230104-68	BTS-3300	
R4	10K	1	230105-74	BTA-10K	
R5	47K		230104-82	BTS-47K	
R6	22K		230104-78	BTS-22K	
R7	100Ω		230104-50	BTS-100	
R8	100Ω		230104-50	BTS-100	

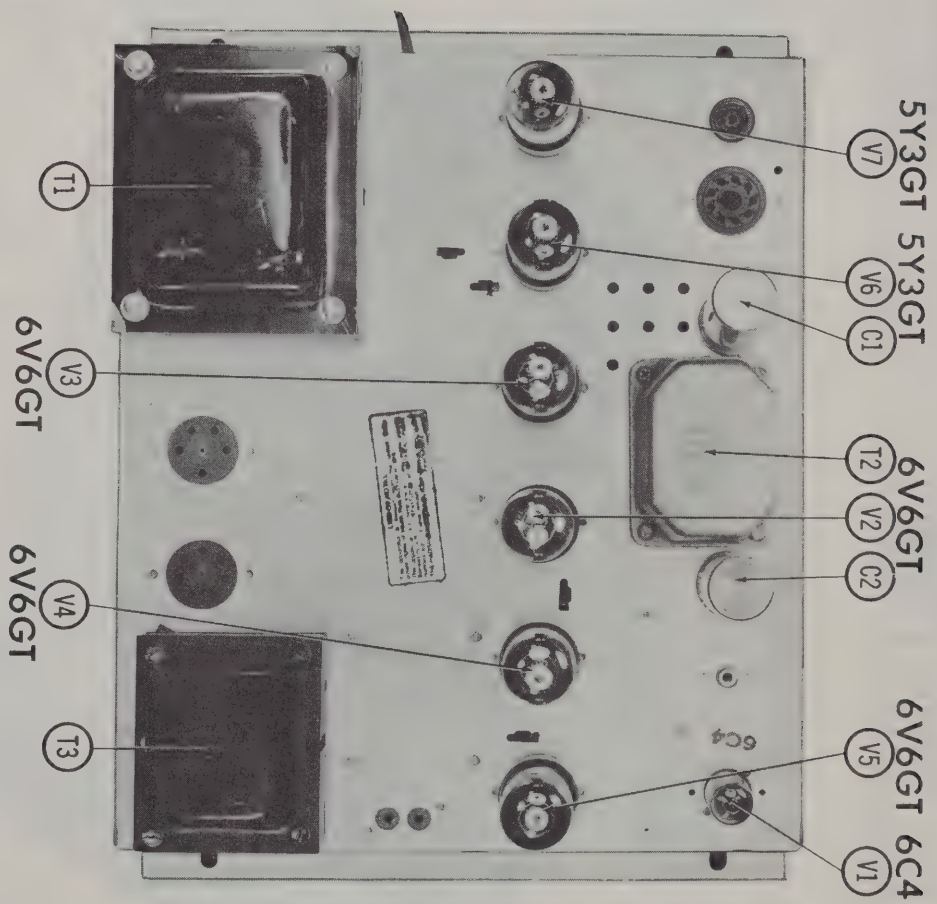
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MAGNAVOX PART No.	IRC PART No.	
R9	100K		230104-86	BTS-100K	
R10	10K		230104-74	BTS-10K	
R11	10K		230104-74	BTS-10K	
R12	100K		230104-86	BTS-100K	
R13	125Ω	10	240021-11	1 3/4A-125	
R14	12Ω	1	230105-39	BTA-12	
R15	100Ω		230104-50	BTS-100	
R16	100Ω		230104-50	BTS-100	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .93A	575VCT @ .160A	5V @ 4A	6.3V @ 2.1A	300071-1		P-3077	P-8332①		

① Tape 6.3V, 1.2A, .9A windings.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO INPUT)

ITEM No.	RESISTANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2000Ω	3050K and 3000Ω	320021-2						
	Turns Ratio								
	1 : 1.5								
	1 : 1.3								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	3700Ω	3-4Ω	330024-1F						
T4	2750Ω	3-4Ω	330032G-1						

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	RF Choke	0Ω		360575-1				
L2	RF Choke	0Ω		360575-1				

AUDIO CHOKE

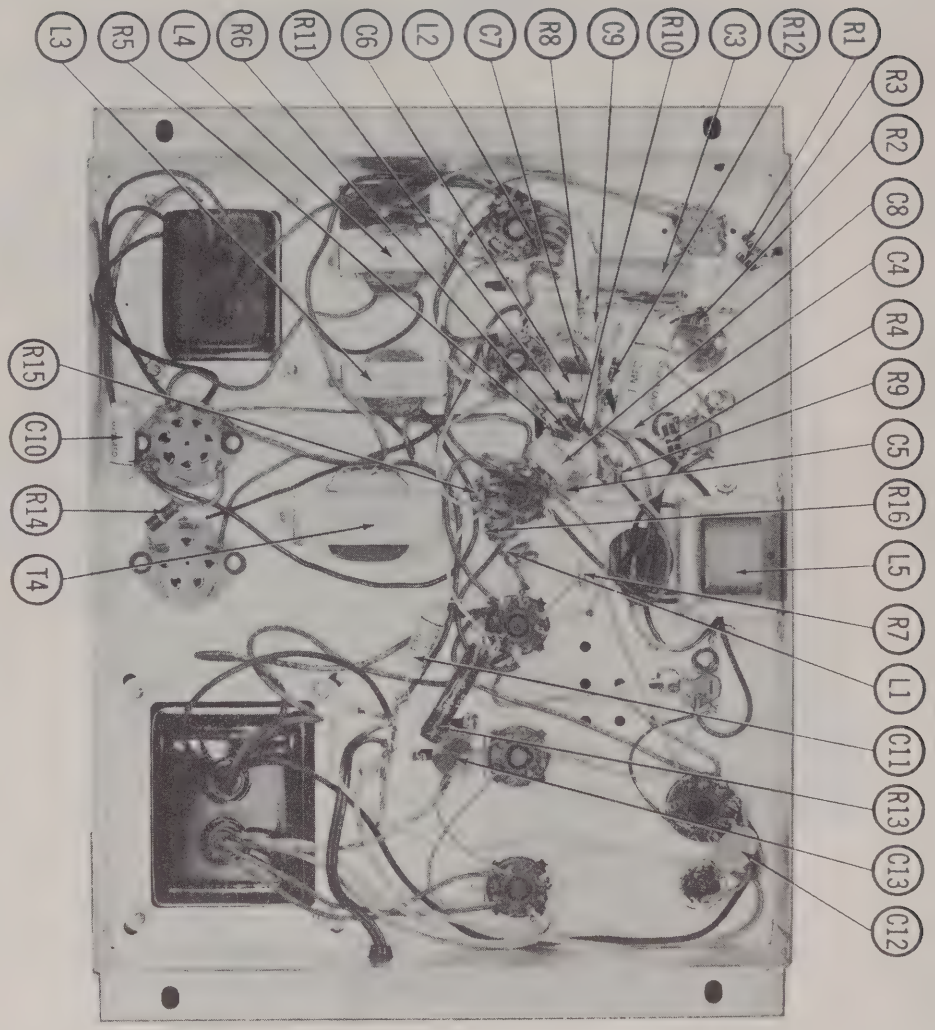
ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L3	.065A	68Ω	.64HY	350047-1A					
L4	.065A	68Ω	.64HY	350047-1A					

FILTER CHOKE

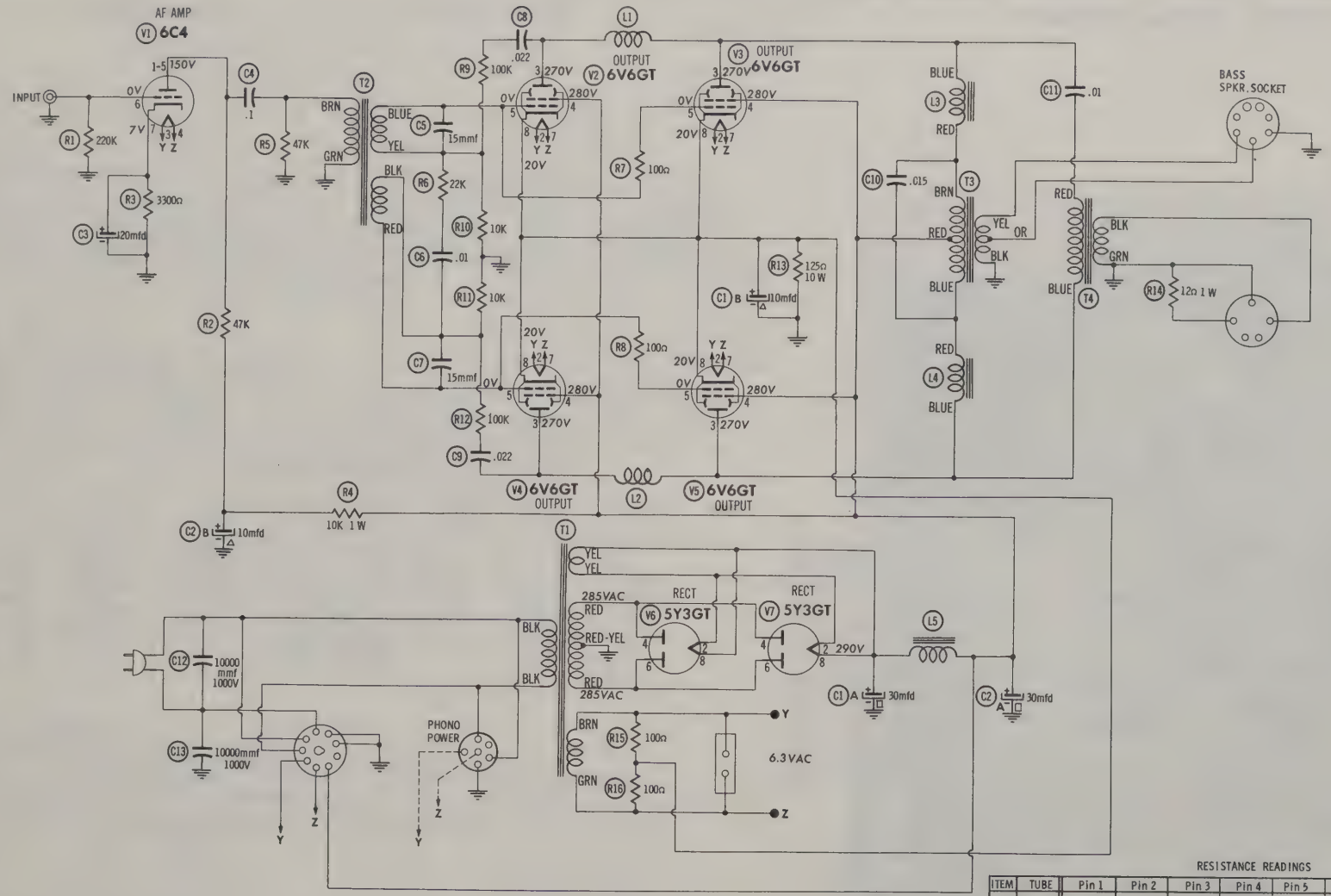
ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L5	.160A	51Ω	1HY	320041-2	C5040	C-2996 ①	C-2327	28C41	C-21X ①

① Drill one new mounting hole.

CHASSIS—BOTTOM VIEW



MAGNAVOX CHASSIS AMP-149



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	6C4	†57K	NC	175Ω	175Ω	†57K	220K	3300Ω	
V2	6V6GT	NC	175Ω	†220Ω	†55Ω	10K	NC	175Ω	125Ω
V3	6V6GT	NC	175Ω	†220Ω	†55Ω	10K	TP	175Ω	125Ω
V4	6V6GT	NC	175Ω	†220Ω	†55Ω	10K	NC	175Ω	125Ω
V5	6V6GT	NC	175Ω	†220Ω	†55Ω	10K	NC	175Ω	125Ω
V6	5Y3GT	NC	32K	NC	32Ω	NC	34Ω	NC	32K
V7	5Y3GT	NC	32K	NC	32Ω	NC	32Ω	NC	32K

† MEASURED FROM PIN 8 OF V7.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MOTOROLA MODELS 56B1A, U, 56L1A, U, 56L2A, U, 56L3A, U, 56L4A, U, 56M1A, U, 56M2A, U, 56M3A, U (Ch. HS-512, A, HS-513, A, HS-514, A)

MOTOROLA MODELS 56B1A, U, 56L1A, U, 56L2A, U, 56L3A, U, 56L4A, U, 56M1A, U, 56M2A, U, 56M3A, U (Ch. HS-512, A, HS-513, A, HS-514, A)

PROPERTY OF
T. J. ANKENSHIP
[illegible] UTICA ST.
[illegible], COLORADO

MOTOROLA MODELS 56B1A, U, 56L1A, U, 56L2A, U, 56L3A, U, 56L4A, U, 56M1A, U, 56M2A, U, 56M3A, U (Ch. HS-512, A, HS-513, A, HS-514, A)

TRADE NAME	Motorola Models 56B1A, U (Ch. HS-512, A), 56L1A, U, 56L2A, U, 56L3A, U, 56L4A, U (Ch. HS-513, A), 56M1A, U, 56M2A, U, 56M3A, U (Ch. HS-514, A)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Three Power Portable AM Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY	110-120 Volts AC-DC (or) 7.5 Volts "A" Supply & 90 Volts "B" Supply
RATING	.12 Amp. @ 117 Volts AC(or) 50MA @ 7.5 Volts DC & 13MA @ 90 Volts DC
TUNING RANGE—BROADCAST	532KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	1620KC	"	"	A4	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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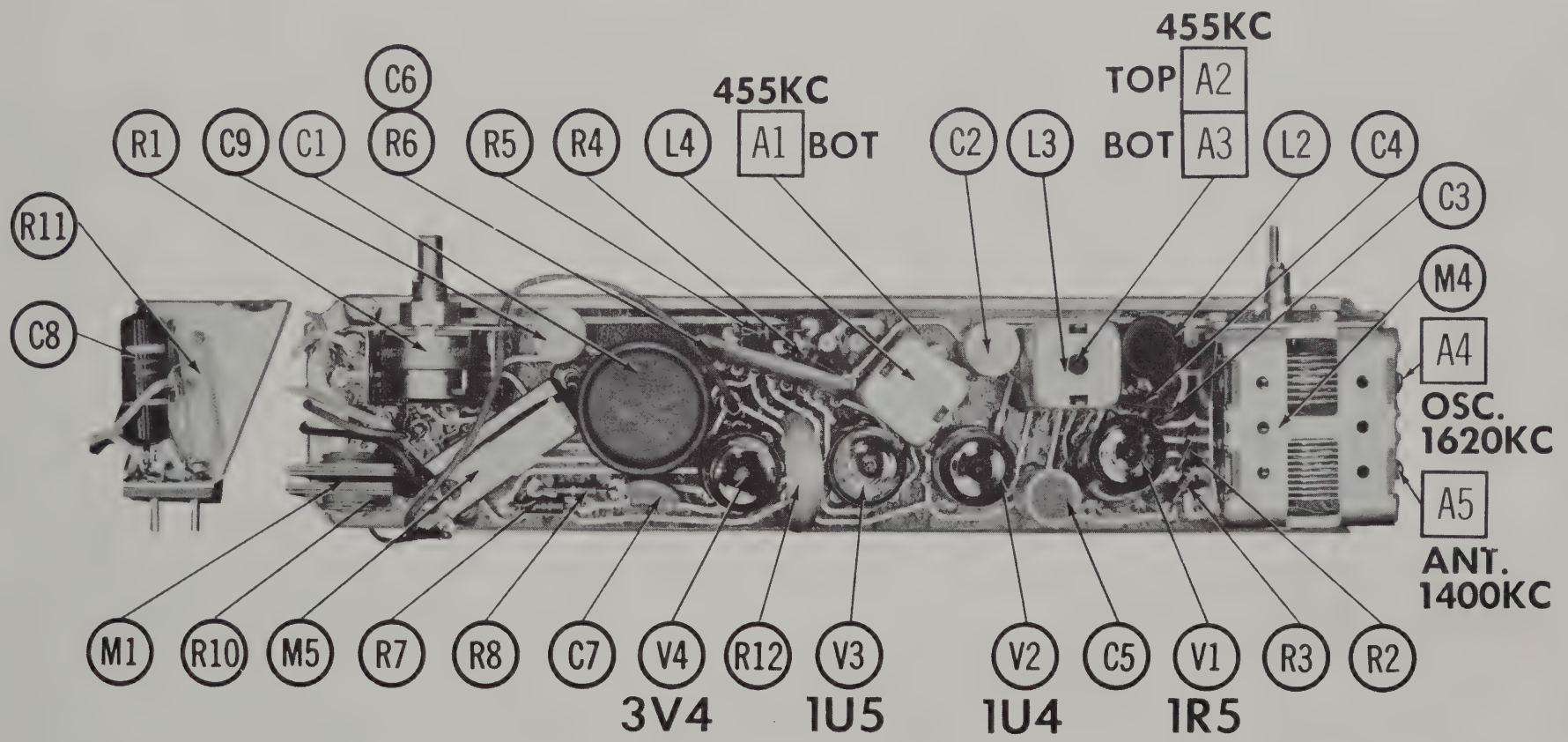


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1U4	
V3	Det.-AVC-AF Amplifier	1U5	
V4	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■80	150	23B633167	▲FH3-64-65					TVL-3431.3
B	▲60	150							
C	250	10							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.05	200	8B120842							
C3	47		21K633231	NP0-D147	DD-470	Z033	831-470	ZT-5447	5TCC-Q47	
C4	10000		21B533471	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C5	.25	100	8K122249					PTS4022	2SE-P22	
C6A	150									
B	2000									
C	10000		†21B631414	†PA572						
D	150									
E	5000									
C7	2000		21K633268	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C8	.047	400	8K490232							
C9	.01	400	8K122334	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	

† Items C6A, C6B, C6C, C6D, C6E, R6A, R6B, R6C, R6D are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1Meg	½	18B633267					Volume & Switch (Note1)

Note 1. Chassis HS-513, A mayuse an alternate control, part #18K633172.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	MOTOROLA PART No.	IRC PART No.	NOTES
R2	100K		6R6075	BTS-100K	
R3	15K		6R6477	BTS-15K	
R4	3.3Meg		6R2118	BTS-3.3Meg	
R5	390Ω		6R5554	BTS-390	
R6A	10Meg			BTS-10Meg	
B	4.7Meg		†21B631414	BTS-4.7Meg	
C	1Meg			BTS-1Meg	
D	3.3Meg			BTS-3.3Meg	
R7	270Ω		6R6432	BTS-270	
R8	680Ω		6R6040	BTS-680	
R9	3.3Ω		17K485412	BW½-3.3	Note 1
R10	820Ω		6R6269	BTS-820	
R11	150Ω		65A633275		Note 2
R12	2000Ω	8	17B633148		

† Items R6A, R6B, R6C, R6D, C6A, C6B, C6C, C6D, C6E are combined in one unit.
Note 1. Not used in Chassis HS-512, HS-512A, HS-513, HS-513A.
Note 2. Special fuse resistor. Item must be ordered from Mfgr.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	11K	3-4Ω	25K635433		A-2927	A-3329	26S49	S-11X	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"	PM	3-4Ω	50C635431	4A07	223S1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Stick	.6Ω		1V635440 *				
L2	Osc. Coil	1.4Ω	10.2Ω	24B635261				
L3	Input IF	23Ω	23Ω	24K633165				
L4	Output IF	28Ω	40Ω	24K633166				

* Alternate part #1V635673 used in 56L Series, Models 56M1A, 56M1AU, 56M2A and 56M2AU.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	MOTOROLA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.063A	48K631295	1386	RS065	6S65	5M4	65S	

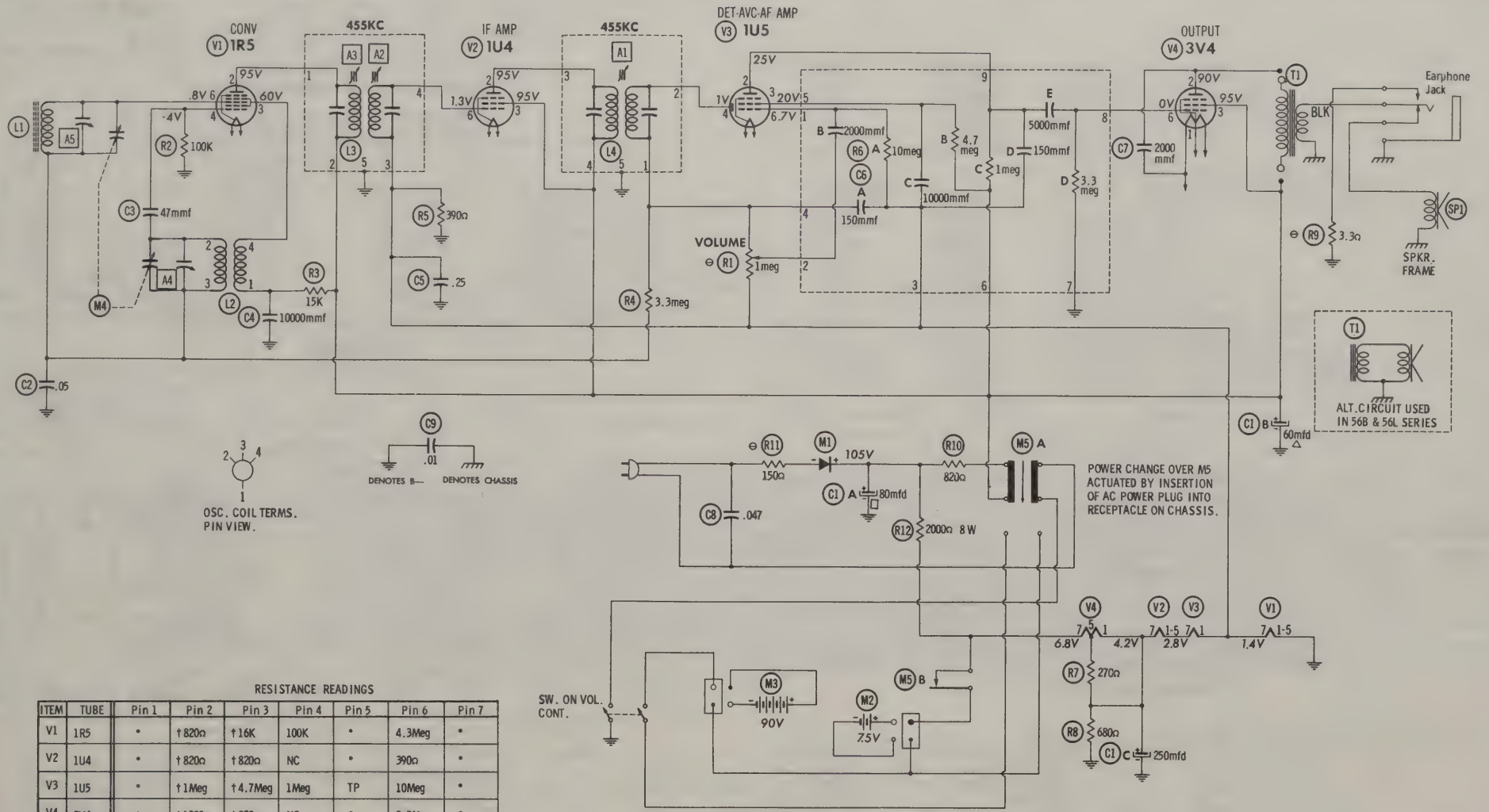
BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	7.5V "A"		717			C5			
M3	90V "B"			479			P60		

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuning Cap.	19B635259	Chassis HS-514, A. 2 Gang (16-315MMF, 11-105MMF)
	Tuning Cap.	19K633279	Chassis HS-512, A. 2 Gang (16-315MMF, 11-105MMF)
	Tuning Cap.	19K635260	Chassis HS-513, A. 2 Gang (16-315MMF, 11-105MMF)
M5A	Switch	1V630598	Power Changeover (DPDT-Slide type)
B	Switch		Power Changeover (SPST-Micro Type) Actuated mechanically by operation of M5A
	Cabinet	1V635461	Models 56B1A, 56B1AU
	Cabinet	1V635458	Models 56L1A, 56L1AU
	Cabinet	1V635457	Models 56L2A, 56L2AU
	Cabinet	1V635456	Models 56L3A, 56L3AU
	Cabinet	1V635455	Models 56L4A, 56L4AU
	Cabinet	1V635481	Models 56M1A, 56M1AU
	Cabinet	1V635482	Models 56M2A, 56M2AU
	Cabinet	1V635483	Models 56M3A, 56M3AU
	Handle Assy.	1V635440	Includes L1. Models 56B1A, 56B1AU, 56M3A, 56M3AU
	Handle Assy.	1V635673	Includes L1. Models 56L1A, 56L1AU, 56L2A, 56L2AU, 56L3A, 56L3AU, 56L4A, 56L4AU, 56M1A, 56M1AU, 56M2A, 56M2AU
	Knob	36C635162	Tuning, 56B series models
	Knob	36B635187	Tuning, 56L series models
	Knob	36C635195	Tuning, 56M series models
	Knob	36K635163	On-off-volume, 56B series models
	Knob	36B635186	On-off-volume, 56L series models
	Knob	36B635194	On-off-volume, 56M series models
	Knob	36B635196	Pointer, 56M series models

MOTOROLA MODEL 56B1A



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	•	†820Ω	†16K	100K	•	4.3Meg	•
V2	1U4	•	†820Ω	†820Ω	NC	•	390Ω	•
V3	1U5	•	†1Meg	†4.7Meg	1Meg	TP	10Meg	•
V4	3V4	•	†1200Ω	†820Ω	NC	•	3.3Meg	•

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.
TP TIE POINT.
• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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MUNTZ MODELS 621-9C, -9T, 624C, T, TS, TW, 627C, TS

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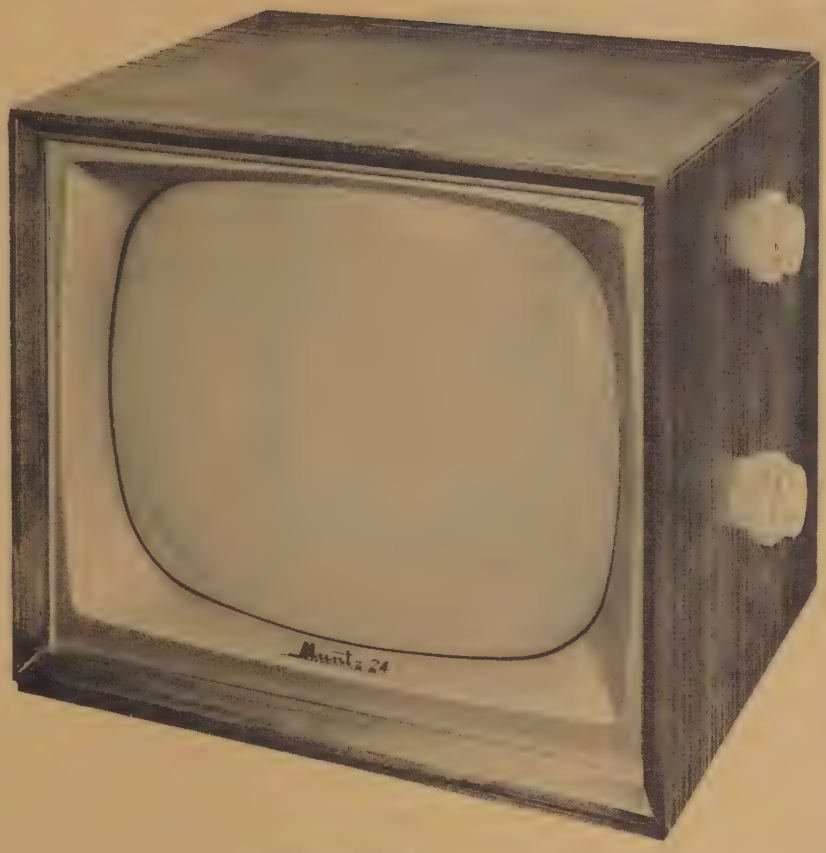

MUNTZ MODEL 624T

TRADE NAME	Muntz Models 621-9C, 621-9T, 624C, 624T, 624TS, 624TW, 627C, 627TS
MANUFACTURER	Muntz TV Inc., 1000 Grey Ave., Evanston, Illinois
TYPE SET	Television Receiver
TUBES	Eleven
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.9 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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MUNTZ MODELS 621-9C, -9T, 624C, T, TS, TW, 627C, TS

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

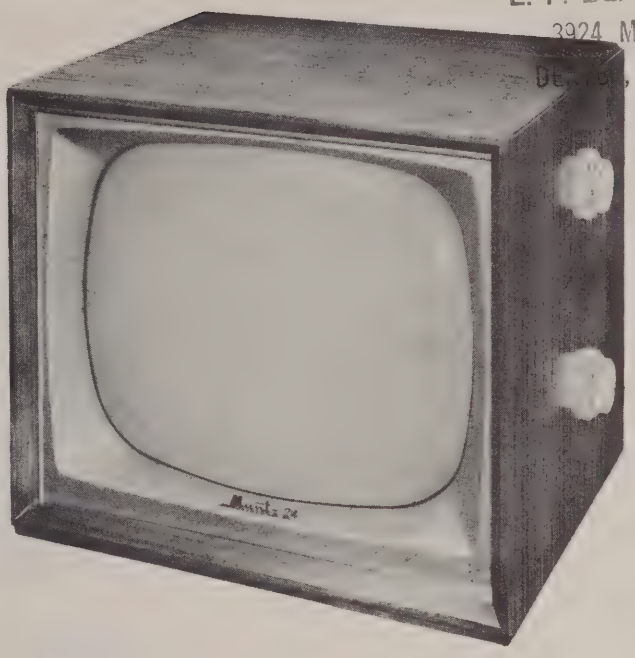
1. Remove 7 push-on type control knobs from side panel of cabinet.

2. Remove 6 wood screws and 1 metal screw. Remove rear cover.

3. Disconnect speaker leads.

4. Remove 4 chassis mounting board bolts . Remove chassis with mounting board.

5. Remove 2 wing nuts. Remove speaker.



MODEL

624T

MUNTZ MODELS 621-9C, -9T,
624C, T, TS, TW, 627C, TS

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 5 wood screws holding metal molding at the top edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold control at the center of rotation and adjust the horizontal ringing coil (L18) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust discriminator secondary (L15) located on top of the chassis for maximum sound and minimum buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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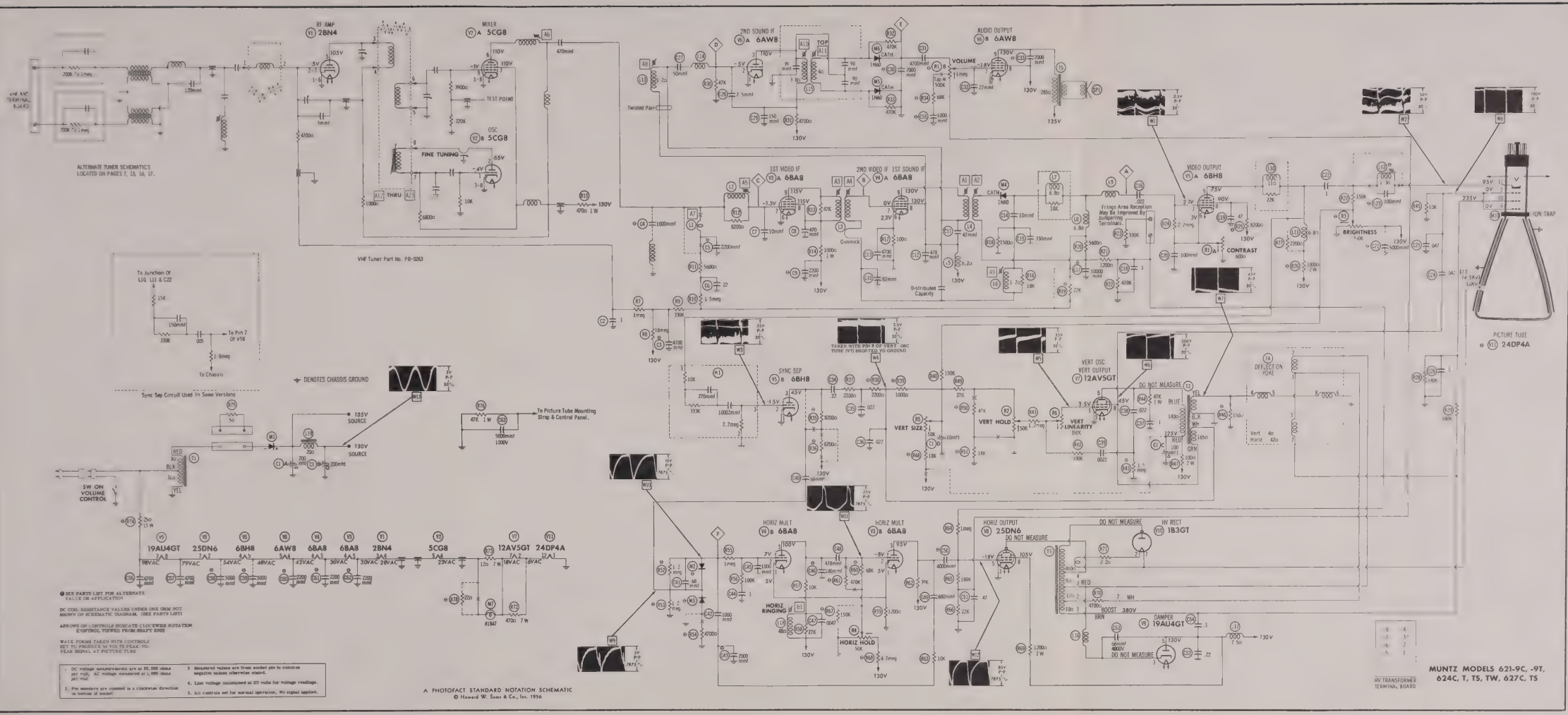
RF AMP V1 2BN4
MIXER V7A 5CG8
OSC V2B 5CG8
FINE TUNING
TEST POINT
THRU
ALTERNATE TUNER SCHEMATICS LOCATED ON PAGES 7, 13, 14, 17.
VHF Tuner Part No. PR-0263
2ND SOUND IF V6A 6AW8
AUDIO OUTPUT V6B 6AW8
VOLUME
Twisted Pair
1ST VIDEO IF V3A 6BA8
2ND VIDEO IF 1ST SOUND IF V4A 6BA8
Gimmick
Distributed Capacity
VIDEO OUTPUT V5A 6BH8
Fringe Area Reception May Be Improved By Jumpering Terminals.
BRIGHTNESS
CONTRAST
ION TRAP
PICTURE TUBE V11 24DP4A
To Junction Of L10, L11 & C22
To Pin 7 Of V5B
To Chassis
Sync Sep Circuit Used In Some Versions
DENOTES CHASSIS GROUND
135V SOURCE
130V SOURCE
To Picture Tube Mounting Strap & Control Panel.
SW ON VOLUME CONTROL
SYNC SEP V5B 6BH8
TAKEN WITH PIN 8 OF VERT. OSC TUBE (V7) GROUNDED TO GROUND
VERT OSC VERT OUTPUT V7 12AV5GT
VERT SIZE
VERT HOLD
VERT LINEARITY
DO NOT MEASURE
DEFLECTION YOKE
Vert 4n Horiz 42n
HORIZ MULT V4B 6BA8
HORIZ MULT V3B 6BA8
HORIZ RINGING
HORIZ HOLD
HORIZ OUTPUT V8 25DN6
HV RECT V10 1B3GT
BOOST 380V
DAMPER V9 19AU4GT
HV TRANSFORMER TERMINAL BOARD
19AU4GT 25DN6 6BH8 6AW8 6BA8 6BA8 2BN4 5CG8 12AV5GT 24DP4A
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)
ARROWS ON ( ) CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
Pin numbers are counted in a clockwise direction as bottom of socket.
Measured values are from socket pin to common negative unless otherwise stated.
Line voltage maintained at 117 volts for voltage readings.
All controls set for normal operation. No signal applied.
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MUNTZ MODELS 621-9C, -9T, 624C, T, TS, TW, 627C, TS

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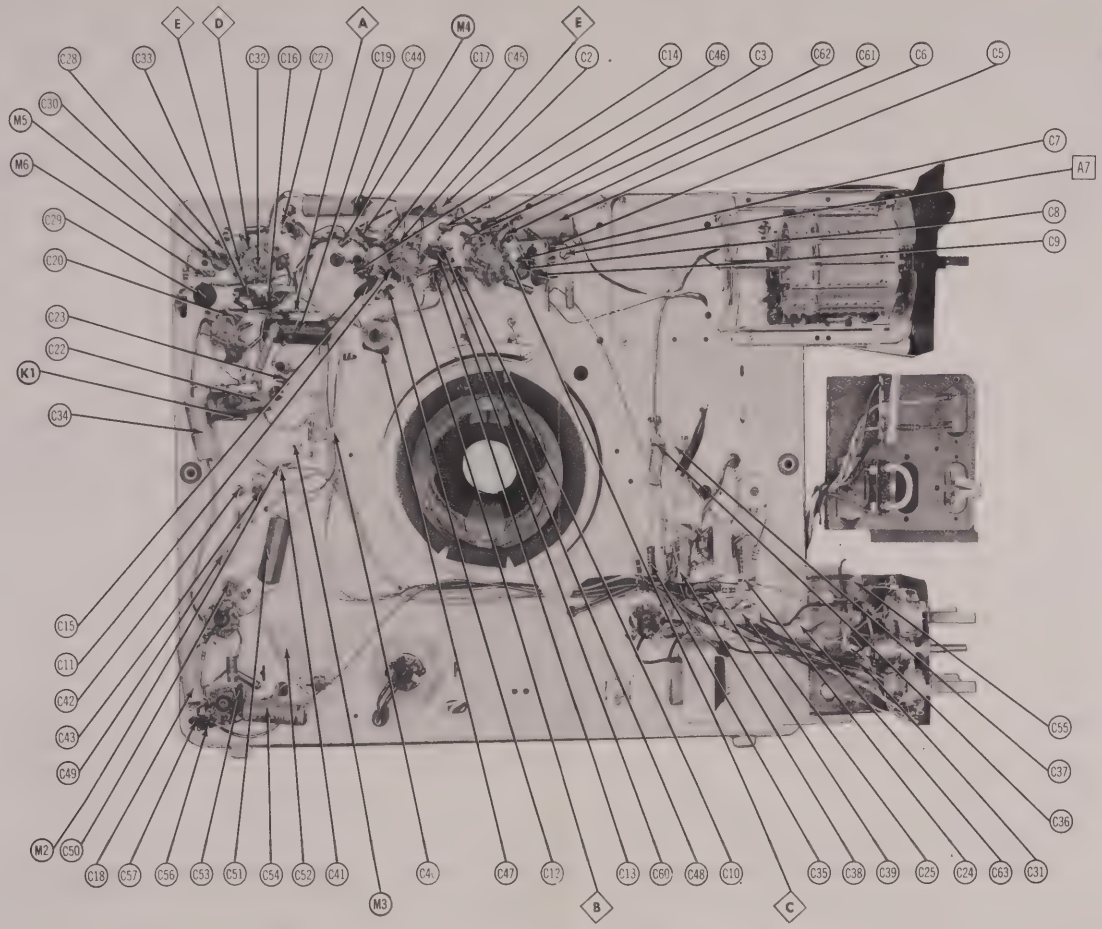

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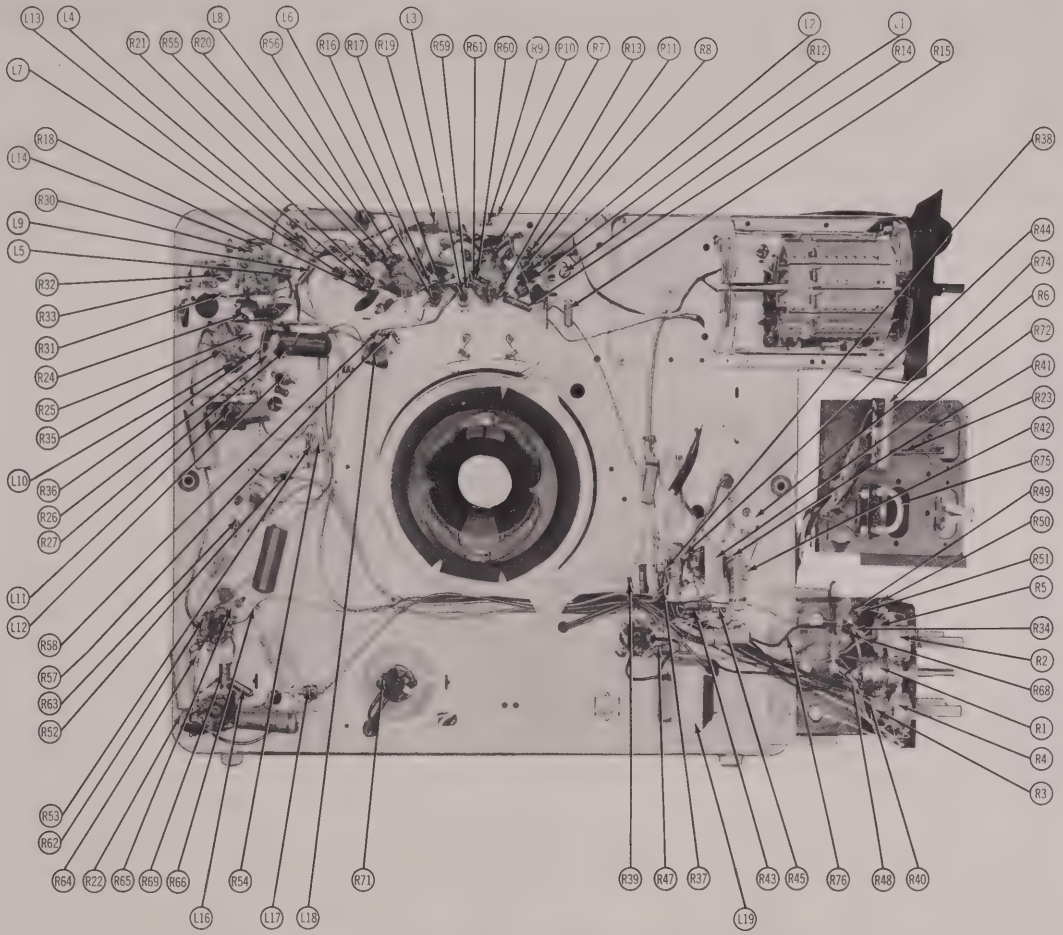
CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART

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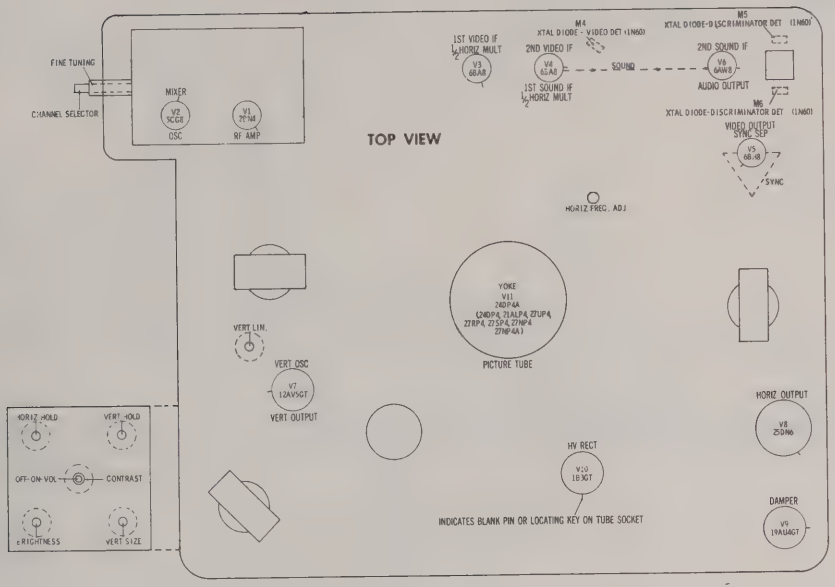


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

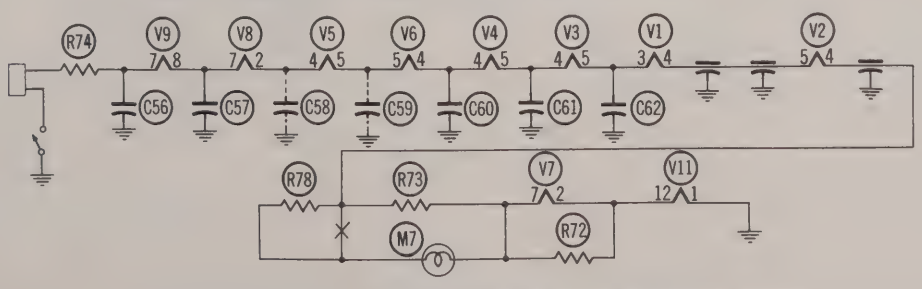
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifier (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4**
No pic, no sound, has snow -**V1, V2, V3**
No pic, has sound, has raster - **V5, V11**
Has pic, no sound - **V4, V6**

SYNC FAILURE
No vert. sync - **V5, V7**
No horiz. sync - **V3, V4, V5**
No vert. or horiz. sync - **V5**

SWEEP FAILURE
No raster, has sound - **V3, V8, V9, V10, V11**
No vertical deflection - **V7**
Poor vert. linearity or foldover - **V7**
Poor horiz. linearity or foldover - **V3, V8, V9**
Narrow picture - **V3, V8, V9, V10, M1**
Vert. off freq. - **V5, V7**
Horiz. off freq. - **V3, V4, V5**

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below).



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 5.5 volt bias supply or battery to the ungrounded side of C6. Connect the positive lead to chassis.
Adjust the one turn link on the second video IF coil (L3) tightly around the coil from midway between the primary and the secondary.
Dress the orange gimmick wire on the first sound IF coil (L6) flat against the video detector shield to eliminate oscillation. Dress the green wire on L6 as close to the chassis as possible and away from the orange wire gimmick.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to point Ⓑ. Low side to chassis.	44MC (10MC Swp)	44.25MC	Any non-interfering channel	Vert. Amp. thru 15K to point Ⓐ. Low side to chassis.	A1, A2	Adjust for maximum amplitude at 44.25MC marker as in Fig. 1.
2.	"	High side to point Ⓒ. Low side to chassis.	"	"	"	"	A3, A4	"
3.	"	High side to ungrounded tube shield floating over converter tube. Low side to chassis.	"	41.25MC 42.5MC 43.0MC 44.75MC 45.75MC 47.25MC	"	"	A5, A6, A7	Adjust for waveform of maximum amplitude similar to Fig. 2. A6 affects the high frequency side of curve. A5 affects the low frequency side and A7 affects the top of the curve. A7 is adjusted by expanding or compressing coil turns.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.
If the waveform and marker position do not remain constant regardless of variation in the sweep amplitude or the waveform appears to have a sharp spike, vary the dress of the orange gimmick wire attached the coil form of L6 in relation to the green lead from the grid of V4.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (470KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓓ thru 470K resistor. Low side to chassis.	A8, A9	Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
5.	"	"	"	"	"	Vert. Amp. thru 470K to point Ⓔ. Low side to chassis.	A10, A11	Adjust A11 so that 4.5MC occurs at center of crossover lines as in Fig. 4. Adjust A10 for maximum amplitude and straightness of crossover lines.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Turn the set on and tune in a TV station, Loosely couple the antenna to the antenna terminals so that the signal is weak. Adjust A8, A9, and A10 for maximum sound and MINIMUM hiss. Connect the antenna directly to the antenna terminals for a strong signal and adjust A11 for maximum sound.

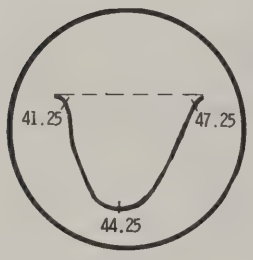


FIG. 1

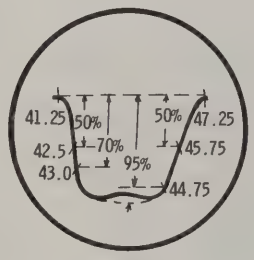


FIG. 2

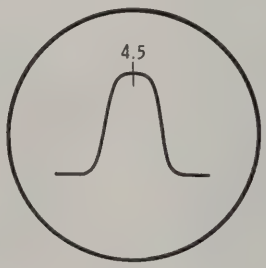


FIG. 3

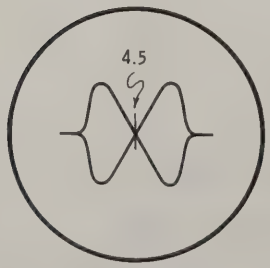


FIG. 4

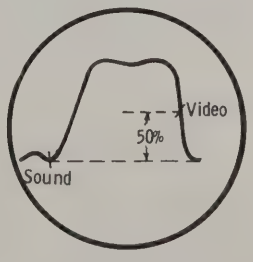


FIG. 5

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR TUNERS #PR0252, PR0253 AND PR0263

The channel oscillator adjustment screws are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

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	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (A). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

VHF OSCILLATOR ALIGNMENT FOR TUNERS PR0251 AND PR0254

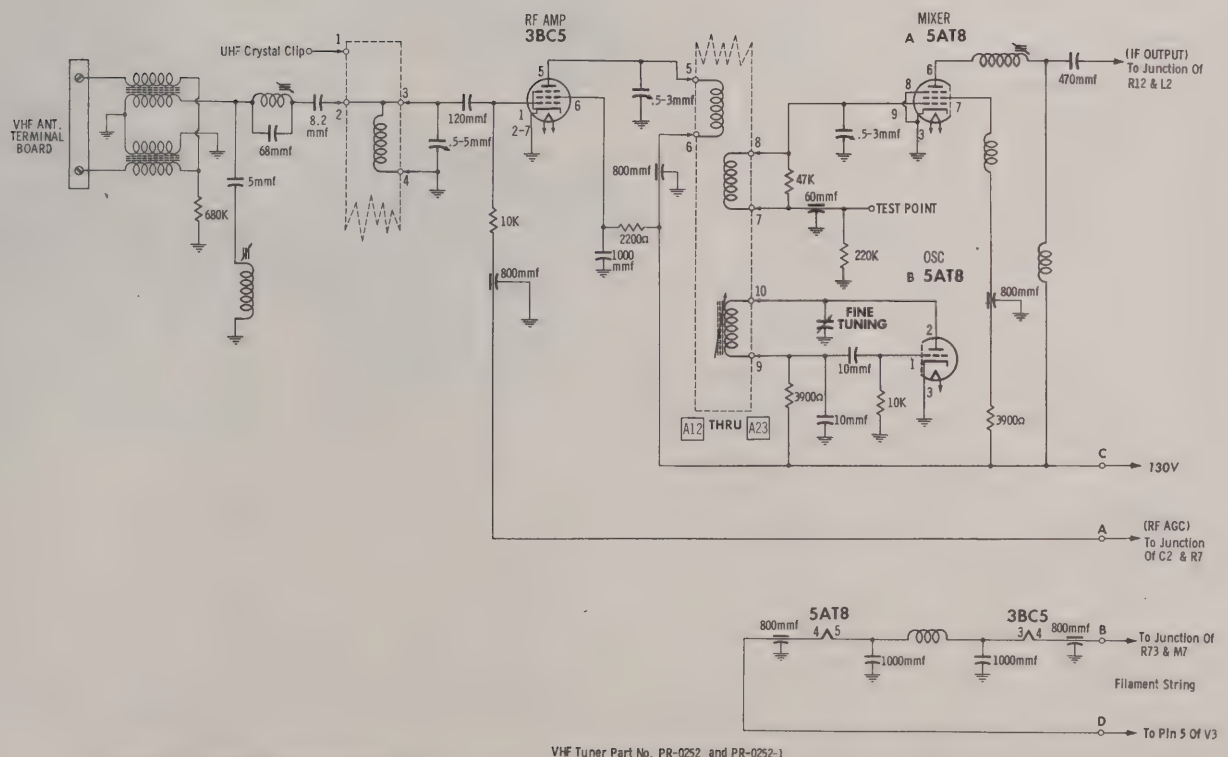
Set the fine tuning to the center of its range. (On tuner #PR0251 the red line on the wheel should be parallel to the chassis. On PR0254 the slot in the center should be parallel to the chassis). Turn the channel selector to the highest high band channel operating in your locality. Adjust A24 for best picture and sound. Turn the channel selector to the highest low band channel operating in the vicinity and adjust A25 for best picture and sound.

VHF RF AND UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and are very stable. Alignment of this portion should not be required in the field.

4.5MC TRAP ALIGNMENT

Adjust A26 for MINIMUM 4.5MC beat in picture.



VHF Tuner Part No. PR-0252, and PR-0252-1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE VHF TUNER SCHEMATIC

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2BN4	0Ω	1.5Meg	11Ω	10Ω	†1500Ω	0Ω	1.5Meg		
V2	5CG8	10K	†7300Ω	0Ω	9Ω	10Ω	†500Ω	†500Ω	0Ω	224K
V3	6BA8	1200Ω	● 90K	†39K	12Ω	11Ω	0Ω	1.6Meg	†1000Ω	†1000Ω
V4	6BA8	1200Ω	2.2Meg	†10K	13Ω	12Ω	100Ω	1500Ω	†25Ω	†25Ω
V5	6BH8	0Ω	2.2Meg	†16K	15Ω	14Ω	● 140Ω	2.2Meg	†8200Ω	†3300Ω
V6	6AW8	0Ω	47K	†4700Ω	13Ω	14Ω	0Ω	● 500K	†20Ω	†285Ω
V7	12AV5	● 1.3Meg	1.5Ω	0Ω	TP	†260Ω	NC	4Ω	● †50K	
V8	25DN6	TP	15Ω	0Ω	TP	160K	TP	18Ω	†1200Ω	TOP CAP *9Ω
V9	19AU4GT	TP	NC	500K	NC	†28Ω	TP	20Ω	18Ω	
V10	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP *420Ω
V11	24DP4A	0Ω	10K	PIN 6 10K	PIN 10 *180K	PIN 11 ● †160K	PIN 12 1.5Ω			

ALL MEASUREMENTS TAKEN WITH "BIAS JUMPER" SWITCH IN CLOSED POSITION.

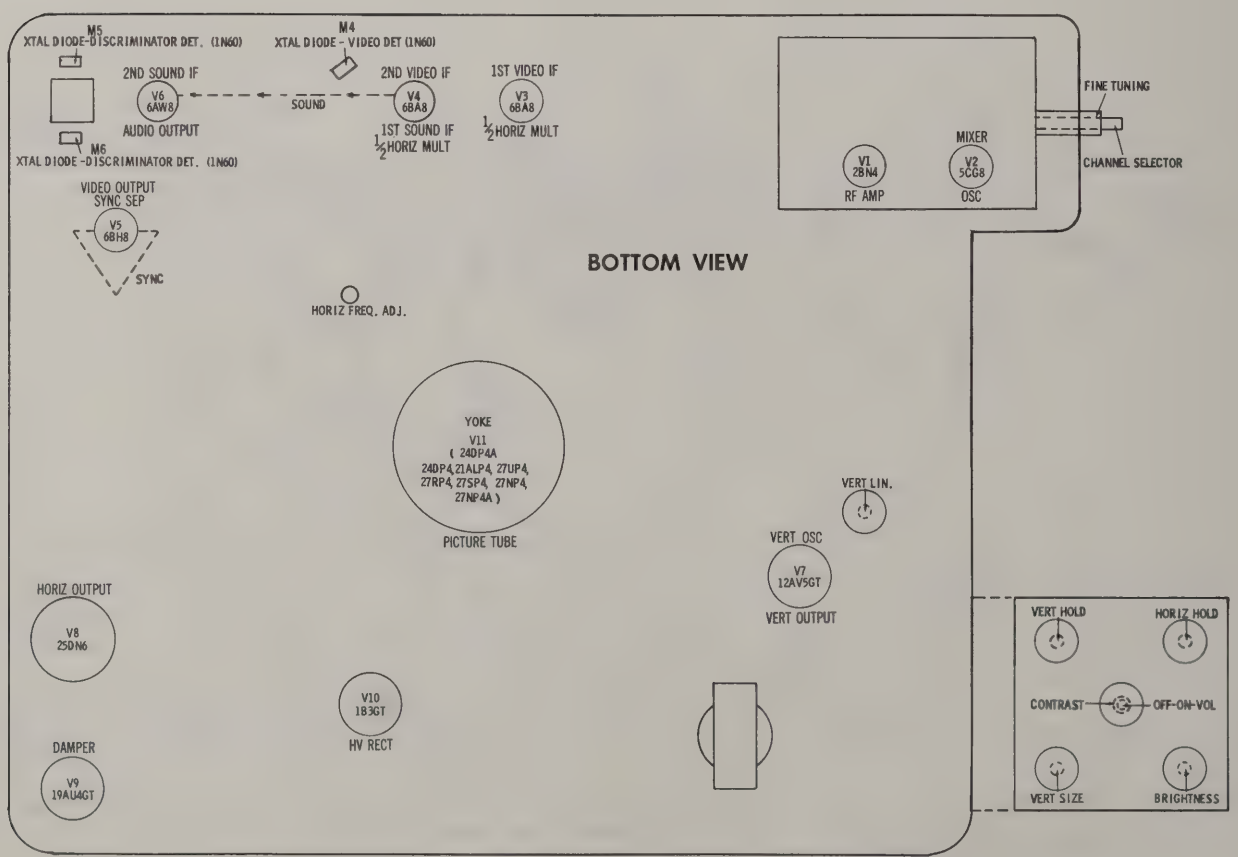
† MEASURED FROM OUTPUT OF M1.

● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

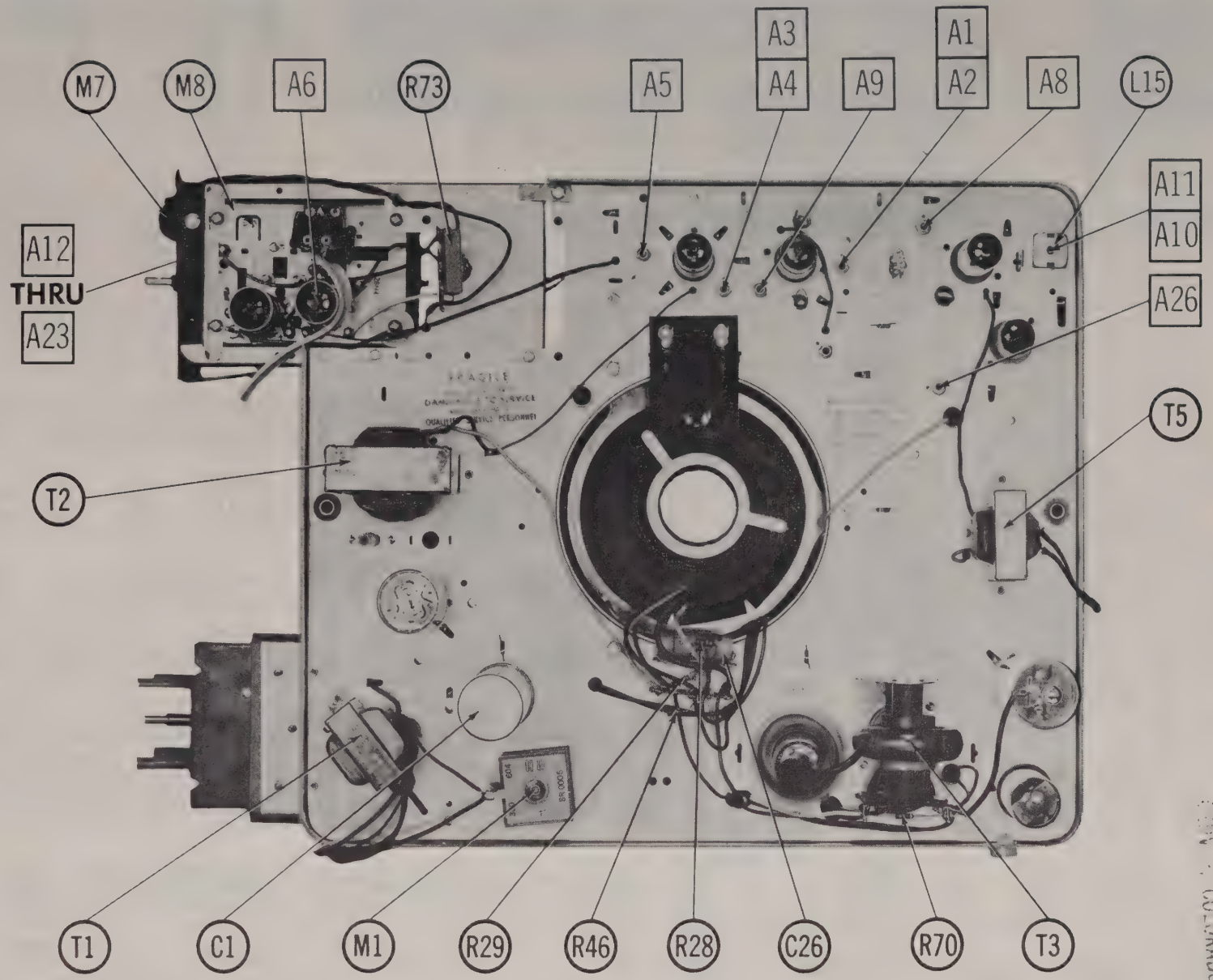
* MEASURED FROM PIN 3 OF V9.

TP TIE POINT

NC NO CONNECTION.



TUBE PLACEMENT CHART



CHASSIS TOP VIEW

MUNTZ MODELS 621-9C, -9T,
624C, T, TS, TW, 627C, TS

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	2BH4	
V2	Oscillator Mixer	5CG8	
V3	1st Video IF Amplifier-Horiz. Mult	6BA8	
V4	2nd Video IF Amplifier-1st Sound IF Amplifier-Noise Mult	6BA8	
V5	Video Output - Sync Separator	6BH8	
V6	2nd Sound IF Amplifier-Audio Output	6AW8	
V7	Vert Osc -Vert Output	15AV5	
V8	Horiz Output	25DN8	
V9	Damper	1BA1/4GT	
V10	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA: MUNTZ PART No.	RCA PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V11	24DP4A 24DP4 24CP4	24DP4A ①	24DP4 ① 24CP4	24DP4A ① 24DP4 24CP4A ②	① Aluminized ② Silver screen "SS"
	27TP4 27CP4A ② 27TP4 ①	24TP4 24CP4A ②	27TP4 ①	27TP4 ①	
	27UP4 27SP4 27NP4 27NP4A 31AL4	31AL4	31AL4	31AL4	
		31AL4A ① 31AL4A ②	31AL4A 31AL4P ①	31AL4A 31AL4B ①	

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	VOLT	REPLACEMENT DATA: MUNTZ PART No	AEROVOX PART No	CORNELL DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No.
C1A	●200	150	CE-0042	AFH34-3S-95		FP41i 8		D-D8	R3238 *
B	●200	150						FMT-339	
C	●100	150							
D	10	15							

● Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: MUNTZ PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.1	300	CF-0038	P288M-1	DF-104	CUB4P1		CEM-501	27M-P1	
C3	4700			BPD-0047	DD-472	KD79	ED-0047	DC-585	5HK-D47	Note 5
C4	1000		CC-0131	BPD-001	DD-102	KD69	ED-001	DC-581	5HK-D1	Note 1
C5	2200			BPD-0022	DS-223	KD73	ED-0023	UC-532	5GA-D23	Note 2
C6	.33	300	CF-0065	P288M-33		CUB3P33		CEM-3322	27M-P33	
C7	16		CC-0153							
C8	470		CC-0139	DL-00047	DD-471	GO60	ED-470	UC-5347	5GA-C47	
C9	2200			BPD-0023	DS-223	KD73	ED-0022	UC-5333	5GA-D23	Note 2
C10	33		CC-0137		DC-330	KD40	TC7-62			
C11	47		CC-0156	N750-D147	TCH-47	NO33	TC7-47	NT-5447	5TCU-Q47	
C12	470		CC-0159	DL-00047	DD-471	GO60	ED-470	UC-5347	5GA-T47	
C13	4700			BPD-0047	DD-472	KD79	ED-0047	DC-585	5HK-D47	
C14	16		CC-0154	NPO-S150	TC5-160	TZ39	TC9-10	ET-545	5TCC-Q	
C15	330		CC-0140			TN34				
C16	.033	300	CF-0063	BPD-03	DF-333	CUB4S33	ED-03	CEM-4123	27M-S33	
C17	10000			BPD-01	DD-103	KO83	ED-01	DC-511	5HK-S1	Note 3
C18	.1	200	CF-0036	P288D-1	DF-104	CUB3P1		CEM-3501	27M-P1	
C19	.47	300	CF-0045	P288M-47		CUB3P47		CEM-3047	27M-P47	
C20	100		CC-0148	DL-0001	DD-101	GO43	ED-100	UC-531	5GA-T1	
C21	1000			BPD-005	DD-502	KO80	ED-005	DC-535	5HK-D5	Note 1
C22	.1	400	CF-0054	P488M-1	DF-104	CUB4P1		CEM-401	47M-P1	
C23	150			BPD-0150	DS-151	TZ38	ED-100	MCB-325	5TCC-T1	Note 1
C24	.047	600	CF-0064	BPD-05	DF-503	CUB3S47		CEM-6147	47M-S47	
C25	.047	600	CF-0064	BPD-05	DF-503	CUB3S47		CEM-6147	27M-S47	
C26	.047	200	CF-0060	BPD-05	DF-503	CUB3S47		CEM-601	47M-S47	
C27	.1	600	CF-0053	P488M-1	DF-104	CUB4P1		CEM-601	47M-P1	
C28	50		CC-0134	NPO-S150	TC5-50	SO34	TC0-50	ET-545	5TCC-Q5	
C29	7.5		CC-0153							
C30	150		CC-0158	N750-S150	TCH-151	NO46	TC7-150		5TCU-T15	
C31	3000		CC-0160	BPD-003	DD-302	KO78	ED-003	DC-533	5HK-D3	Note 3
C32	3000			BPD-0047	DD-472	KD79	ED-0047	DC-585	5HK-D47	
C33	4700			S123	DS-330	TP23	GP-23	UC-5432	5GA-Q23	
C34	3000		CC-0155	BPD-003	DD-302	KO78	ED-003	DC-533	5HK-D3	Note 3
C35	.33	300	CF-0065	P288M-33		CUB3P33		CEM-3033	27M-P33	
C36	.033	600	CF-0052	BPD-03	DF-333	CUB4S33	ED-03	CEM-4123	27M-S33	
C37	.033	200	CF-0052	BPD-03	DF-333	CUB4S33	ED-03	CEM-4123	27M-S33	
C38	.01	600	CF-0013	P488M-1	DF-104	CUB4P1		CEM-601	47M-P1	
C39	.1	600	CF-0013	P488M-1	DF-104	CUB4P1		CEM-601	47M-P1	
C40	.033	600	CF-0063	BPD-03	DF-333	CUB4S33	ED-03	CEM-6123	47M-S33	
C39	.0033	600	CF8E-0200	BPD-0033	DS-332	CUB2S33	ED-0033	CEM-6332	47M-D33	
C40	68		CC-0146	NPO-S68	TC5-68	Z038	TC0-68		5TCC-Q68	
C41	68		CC-0146	NPO-S68	TC5-68	Z038	TC0-68		5TCC-Q68	
C42	1000		CC-0127	DL-001	DD-102	GO69	ED-100	UC-531	5GA-D1	
C43	3000			DL-003	DD-302	KO78	ED-003	DC-533	5GA-D3	Note 3
C44	.1	200	CF-0065	P288N-1	DF-104	CUB3P1		CEM-301	27M-P1	
C45	1000		CC-0127	BPD-001	DD-103	KO69	ED-001	DC-581	5HK-D1	
C46	100			NPO-S100	DS-101	TZ30	ED-100	ET-531	5TCC-T1	Note 4
C47	.0047	500	CF8-0123	J464-00047		IR3D47			MS-347	
C48	470	500	CM-0048	J464-00047	DS-471	SR57A7	ED-470		MS-347	
C49	680	500	CM-0049	J464-00068	DS-681	IR5T68	ED-680		MS-368	
C50	4000			BPD-004	DD-402	KO78	ED-004	UC-534	5HK-D4	Note 3
C51	.47	300	CF-0045	P288N-47		CUB3P47		CEM-3047	27M-P47	
C52	.33	200		P288N-33		CUB3P33		CEM-3033	27M-P33	
C53	68	4000	CC-0137	HVD-80-68						
C54	.1	400	CF-0054	P488N-1	DF-104	CUB4P1		CEM-401	47M-P1	
C55	1000		CC-0127	BPD-001	DD-103	KO69	ED-001	DC-581	5HK-D1	Note 1
C56	4700			BPD-0047	DD-472	KD79	ED-0047	DC-585	5HK-D47	
C57	4700			BPD-0047	DD-472	KD79	ED-0047	DC-585	5HK-D47	
C58	5000			BPD-005	DD-502	KO80	ED-005	DC-535	5HK-D5	Note 1
C59	5000			BPD-001	DD-502	KO80	ED-005	DC-535	5HK-D5	Note 1
C60	2200			BPD-0022	DS-222	KO73	ED-0022	DC-532	5HK-D22	Note 2
C61	2200			BPD-0022	DS-222	KO73	ED-0022	DC-532	5HK-D22	Note 2
C62	5000			BPD-0022	DS-222	KO73	ED-0022	DC-532	5UK-D22	Note 2
C63	5000	1000	CC-0133	HVD-15-47002	DD18-502	VD47	ED15-4700	DC-534	10HK-D47	

Note 1. Not used in some versions
Note 2. Some versions use 1000MMF in this application (part #CC-0117).
Note 3. Some versions may use 10000MMF in this application.
Note 4. Some versions may use 82MMF in this application (part #CM-0052).
Note 5. Some versions may use 10000MMF in this application (part #CC-0081).

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: MUNTZ PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	6600		VC-0056	P12			UF82R	Contrast (Panel) Note 1
B	1Meg			X2-56			URB75R	Volume (Sens) Tap ● 500K
C	Switch		Not Reg	KB-1			UB-3R	Attach to R1B
R2A	50K	½	VC-0051	BX-31	A47-50K-S	QU-133	PTA54L	Vert. Hold
B	Shaft		Not Reg		FXS-1/4	BQ	Not Reg.	Attach to R2A
R3A	350K	½	VC-0061	BX-59	A47-500K-S	BU-132	SU-50	Brightness-Note 3
B	Shaft		Not Reg.	Not Reg.	FXS-1/4	TM3-X2T	Not Reg.	Attach to R3A
R4A	50K	½	VC-0051	BX-31	A47-50K S	QU-133	PTA54L	Horiz. Hold
B	Shaft		Not Reg	Not Reg.	FXS-1/4	BQ	Not Reg.	Attach to R4A
R5A	500K	½	VC-0031	BX-51	A47-500K-S	QU-133	PTA54L	Vert. Size
B	Shaft		Not Reg	Not Reg.	FXH-1/4	BQ	Not Reg.	Attach to R5A
R6A	350K	½	VC-0061	BX-59	A47-500K-S	BU-132	SU-50	Vert. Linearity
B	Shaft		Not Reg	Not Reg	FXH-1/4	TM3-X2T	Not Reg.	Attach to R6A

Note 1. Some versions may use part #VC-0056 in this application.
Note 3. Some versions may use part #VC-0065 in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: MUNTZ PART No.	IRC PART No.	NOTES
R7	15Meg		RC-1004-15	BTB-15Meg	
R8	15Meg			BTB-15Meg	
R9	330K		RC-3303-18	BTB-330K	
R10	1.5Meg		RC-1504-18	BTB-1.5Meg	
R11	6800Ω		RC-5601-18		
R12	6300Ω		RC-6301-18		
R13	47K		RC-4702-18		
R14	1000Ω	1	RC-1001-11	BTA-1000	
R15	475Ω	1	RC-470-11	BTA-470	
R16	18K		RC-1803-18		
R17	100Ω		RC-105-18	BTB-100	
R18	1500Ω		RC-1501-18		
R19	22K		RC-2202-18	BTB-22K	Note 1
R20	5600Ω		RC-5601-18	BTB-5600	
R21	1200Ω		RC-1201-18	BTB-1200	
R22	470K		RC-4703-18	BTB-470K	
R23	330K		RC-3303-18	BTB-330K	
R24	2.2Meg		RC-2204-18	BTB-2.2Meg	Note 10
R25	820Ω			BTB-8200	Note 1
R26	3300Ω	2		BTB-3300	Note 2
R27	180K		RC-1803-18	BTB-180K	
R28	330K		RC-3303-18	BTB-330K	
R29	180K		RC-1803-18	BTB-180K	
R30	47K		RC-4703-18	BTB-47K	
R31	4700Ω		RC-4701-18	BTB-4700	
R32	470K		RC-4703-18	BTB-470K	
R33	470K		RC-4703-18	BTB-470K	
R34	68K			BTB-68K	Note 1
R35	8200Ω			BTB-8200	Note 2
R36	3300Ω			BTB-3300	Note 1
R37	200Ω		RC-2001-18	BTB-2200	
R38	2200Ω		RC-2201-18	BTB-2200	Note 3
R39	1000Ω			BTB-1000	
R40	150K		RC-1503-18	BTB-150K	
R41	1.5Meg		RC-1504-18	BTB-1.5Meg	
R42	330K		RC-3303-18	BTB-330K	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: MUNTZ PART No.	IRC PART No.	NOTES
R43	1.5Meg			BTA-1.5Meg	Note 8
R44	47K	1	RC-4702-11	BTA-47K	
R45	10K		RC-1003-18	BTB-10K	
R46	150Ω				Note 1
R47	100Ω	2	RC-100-15	BTB-100	
R48	18K			BTB-18K	Note 2
R49	27K		RC-2703-18	BTB-27K	
R50	47K			BTB-47K	Note 1
R51	18K			BTB-18K	Note 1
R53	1.5Meg				Note 8
R53	1.5Meg				Note 8
R54	4700Ω				Note 1
R55	1Meg		RC-1004-18		
R56	300K		RC-1003-18		
R57	10K		RC-1003-18		
R58	27K		RC-2703-18		
R59	1200Ω		RC-1201-18		
R60	68K		RC-6803-18		Note 10
R61	470K				Note 1
R62	39K		RC-3903-18		
R63	10K		RC-1003-18		
R64	1Meg		RC-1004-18		
R65	180K		RC-1803-18		
R66	22K		RC-2202-18		
R67	150K				Note 1
R68	4.7Meg				Note 9
R69	1200Ω	2	RC-1201-15	BTB-1200	
R70	4700Ω		RC-4702-18	BTB-4700	
R71	2.2Ω		RW-002-18		
R72	470Ω	7	RW-470-17	PWV-470	
R73	13Ω	7	RW-013-17	PWV-13	
R74	25Ω	15	RW-0045	RS-25	Note 7
R75	5Ω	5	RW-005-13	PX5.6	
R76	47K	1	RC-4702-11	BTA-47K	
R77	2200Ω			BTB-2200	
R78	22Ω		RC-022-18	BTB-22	Note 1

Note 1. Not used in some versions.
Note 2. Some versions use 10K in this application (Part #RC-1003-18).
Note 3. Some versions use 1800Ω in this application (Part #RC-150-18).
Note 4. Some versions use 2700Ω in this application (Part #RC-2701-18).
Note 5. Some versions use 1.5Meg in this application (Part #RC-1504-18).
Note 8. Some versions use 470K in this application (Part #RC-4703-18).
Note 7. Some versions use 25, 5W in this application (Part #RW-0044).
Note 8. Some versions use 5.6K, 2W in this application (Part #RC-5801-12).
Note 9. Some versions use 2.2Meg in this application (Part #RC-2204-18).
Note 10. Some versions use 56K in this application.

TRANSFORMER (LINE BOOST)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	MUNTZ PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	125V tap ① 117V ②				TP-0031					
	.7A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	MUNTZ PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert.Osc. & Output Trans.	TO-0051							
T3	Horiz.Output Trans.	TO-0050	FB41i * ①	HVO-36 * ①	2357i * ①	X094 * ①	A-2321 * ①	FLY-18 * ①	D-50 * ①
T4A	Yoke (90°) Horiz. (54MH)	LC-0085-1							
B	Vert.(4.3MH)	PR-0234 ②							

① Drill new mounting hole(s).
② Yoke rear cover and centering device.
† This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	4	9	9	9	7	9	9	
	3	7	7	7	4	7	7	
	2	NC See Note ②	NC See Note ②	NC See Note ③	NC See Note ③	T	NC See Note ⑤	NC See Note ⑤
	1	1	1	1	1	1	1	
Special Recon. —		③	⑤	③	③		③	③

① Install new damping network consisting of 50-100MMF ⑥ 2KV and 1000Ω ½ Watt connected in series across horizontal yoke terminals #2 and #1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: MUNTZ PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T6	6K	3-4Ω	TO-0049-1	21007	A-3019	A-3877 ①	26S49	S-5Z	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V C	IMP	REPLACEMENT DATA: MUNTZ PART No	QUAM PART No	RCA TYPE No	NOTES
SP1	5 1/4"	PM	3-4Ω		SK-0038-1	82A1	21T81	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: MUNTZ PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Coupling Coil					
L2	1st. Video IF	LC-0087				
L3	2nd. Video IF	LC-0089				
L4	3rd. Video IF	LC-0090				
L5	Shunt Peaking Coil	LC-0057-10	19-3100	TV-121	6177	100 Microhenries
L6	1st.Sound IF	LC-0095			6194 *	
L7	Series Peaking Coil	LC-0057-11	19-4400 *			990 Microhenries, wound on 15K resistor
L8	Shunt Peaking Coil	LC-0057-13	19-3300		6190	470 Microhenries
L9	Series Peaking Coil	LC-0061				4.7 Microhenries
L10	Series Peaking Coil	LC-0057-9	19-3300 ■		6183 ■	330 Microhenries, wound on 22K resistor
L11	Shunt Peaking Coil	LC-0057-8	19-3680		6168	680 Microhenries
L12	4.5MC Trap					
L13	2nd.Sound IF	LC-0095-1				
L14	RF Coil	LC-0091				4.7 Microhenries
L15	Discriminator	LC-0078				
L16	RF Choke	LC-0096				2 Microhenries
L17	RF Choke	LC-0097				2 Millihenries

* Parallel with 18K resistor.
■ Parallel with 22K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	SEC.	REPLACEMENT DATA: MUNTZ PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L18	48Ω		LC-0077	19-1576	TV-153	6210			HS-5	

FILTER CHOKE

ITEM No	RATINGS: TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE @ CURRENT (000 "A.")	REPLACEMENT DATA: MUNTZ PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
L19	.250A	20Ω	.75 HY	LC-0081	C6041 ①		C-2328 ①		

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MUNTZ PART No.	REPLACEMENT DATA
K1	Sync Couplate	10K, 330K, 2.2Meg, 270MMF, 10000MMF	CC-0081	Aerovox PA531 Centralab Cornell-Dubilier Erie Sprague

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	MUNTZ PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.285A	SR-0005 SR-0008 ①	1090A	MR300	6S300	6Q4	300	① Alternate part no.

SELENIUM DIODE

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	MUNTZ PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M2 M3		SR-0004 SR-0004 SR-0006 ①	1215 1215	1T1 1T1				① Alternate part no.

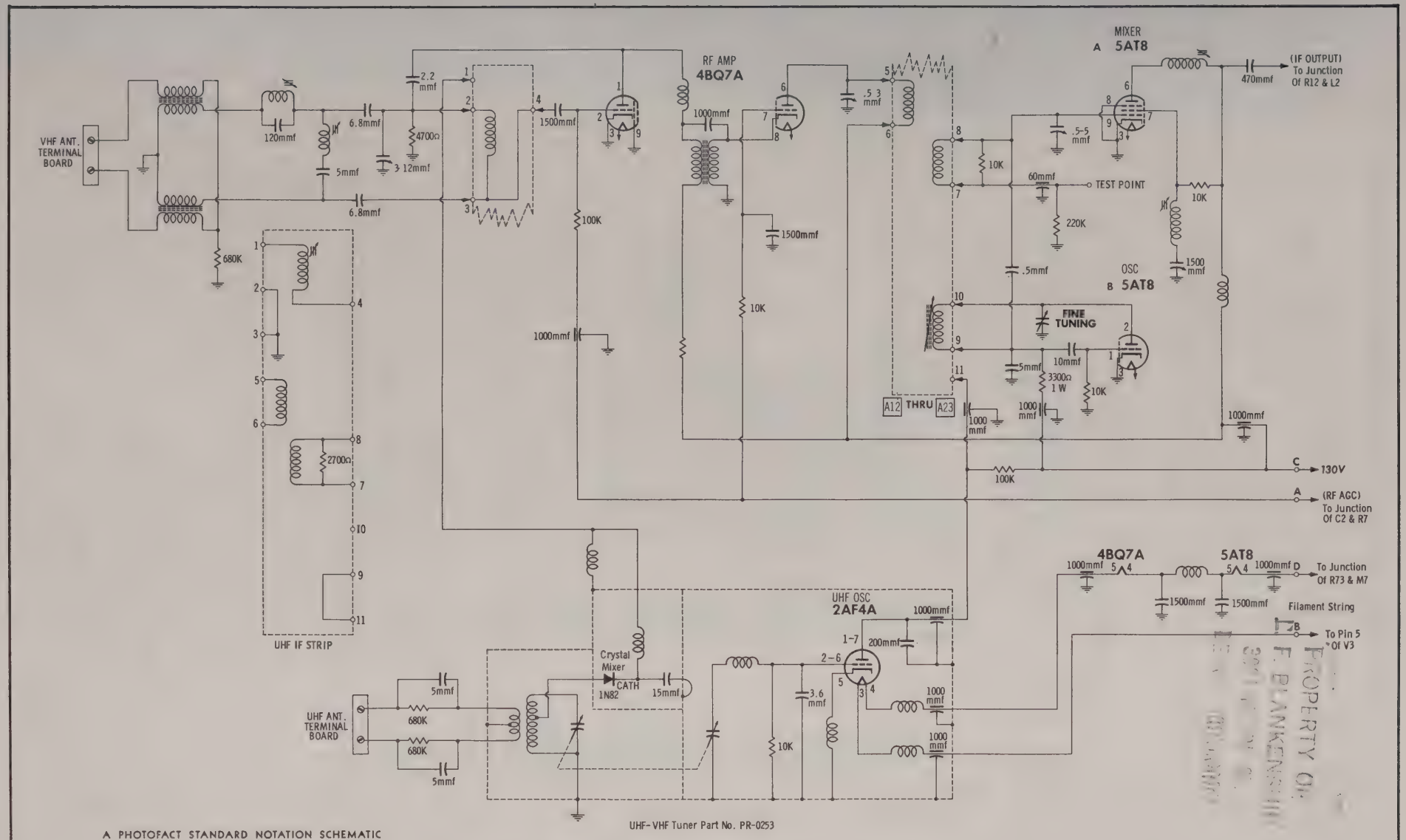
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		MUNTZ PART No.	SYLVANIA PART No.	
M4	1N60	CX-0031	1N60	Video Detector (Pigtail)
M5	1N60	CX-0031	1N60	Discriminator Det. (Pigtail)
M6	1N60	CX-0031	1N60	Discriminator Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MUNTZ PART No.	NOTES
M7	Dial Light	LS-0004-1	#1847
M8	*Tuner	PR-0263	VHF - Not used in some versions
M9	Centering Device	PR-0234	Includes deflection yoke (T4) Rear cover
M10	Ion Trap	PR-0229	
	Cabinet	CW-0061	Pebble Tan (Table, metal) 624 Models
	Cabinet	CW-0066	Pebble Tan (Table, metal) 621 Models
	Cabinet	CW-0056	Pebble Tan (Table, metal) 627 Models
	Cabinet	CW-0062	Walnut (Consolette) 624 Models
	Cabinet	CW-0058	Walnut (Consolette) 627 Models
	Cabinet	CW-0057	Walnut (Consolette) 621 Models
	Cabinet	CW-0062-2	Mahogany (Consolette) 624 Models
	Cabinet	CW-0058-2	Mahogany (Consolette) 627 Models
	Cabinet	CW-0057-2	Mahogany (Consolette) 621 Models
	Cabinet	CW-0062-4	Blonde (Consolette) 624 Models
	Cabinet	CW-0058-4	Blonde (Consolette) 627 Models
	Cabinet	CW-0057-4	Blonde (Consolette) 621 Models
	Cabinet	CW-0064	Mahogany (Table, wood) 624 Models
	Cabinet	CW-0065	Mahogany (Table, wood) 621 Models
	Cabinet	CW-0064-2	Blonde (Table, wood) 624 Models
	Cabinet	CW-0065-2	Blonde (Table, wood) 621 Models
	Knob	KB-0056-3	VHF channel selector (12 position) translucent tan
	Knob	KB-0061-3	VHF channel selector (13 position) translucent tan
	Knob	KB-0067-3	VHF channel selector (13 position, turret type) translucent tan
	Knob	KB-0066-3	UHF channel selector (turret type) translucent tan
	Knob	KB-0060-3	UHF selector & fine tuning (switch type) translucent tan
	Knob	KB-0068-3	VHF-UHF fine tuning (turret type) translucent tan
	Knob	KB-0055-3	VHF fine tuning (translucent tan)
	Knob	KB-0062-3	VHF fine tuning (translucent tan)
	Knob	KB-0058-3	On-off-volume
	Knob	KB-0063-3	Contrast
	Knob	KB-0064-3	Service controls (4 used) translucent tan
	Dial	DP-0009	UHF
	Safety Glass	WG-0019-3	Model 624TS
	Safety Glass	WG-0020-3	Models 624TW, 624C
	Safety Glass	WG-0023	Model 627TS
	Safety Glass	WG-0024	Models 627TW, 627T
	Safety Glass	WG-0019	621 Models (Table model,metal)
	Safety Glass	WG-0019-2	Clear - 621 Models (Table model, wood) & 621 Models (Consolette)
	Safety Glass	WG-0020-2	Black tinted - 621 Models (Table model, wood) & 621 Models (Consolette)
	Mask	ES-0056	Model 627TS
	Mask	ES-0056-1	Models 627TW, 627C
	Mask	ES-0044-2	Models 624TW, 624C
	Mask	ES-0044-1	Model 624TS
	Mask	ES-0055	621 Models (Table model, metal)
	Mask	ES-0064-2	Gold - 621 Models (Table model, wood) & 621 models (Consolette)
	Mask	ES-0057-3	Grey (optional) 621 Models (Consolette)

* The following are a list of alternate tuners that may be used in some versions: PR-0251 (VHF), PR-0252 (VHF), PR-0252-1 (VHF), PR-0253 (VHF-UHF), PR-0254 (VHF).



UHF-VHF Tuner Part No. PR-0253

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ALTERNATE VHF-UHF TUNER SCHEMATIC

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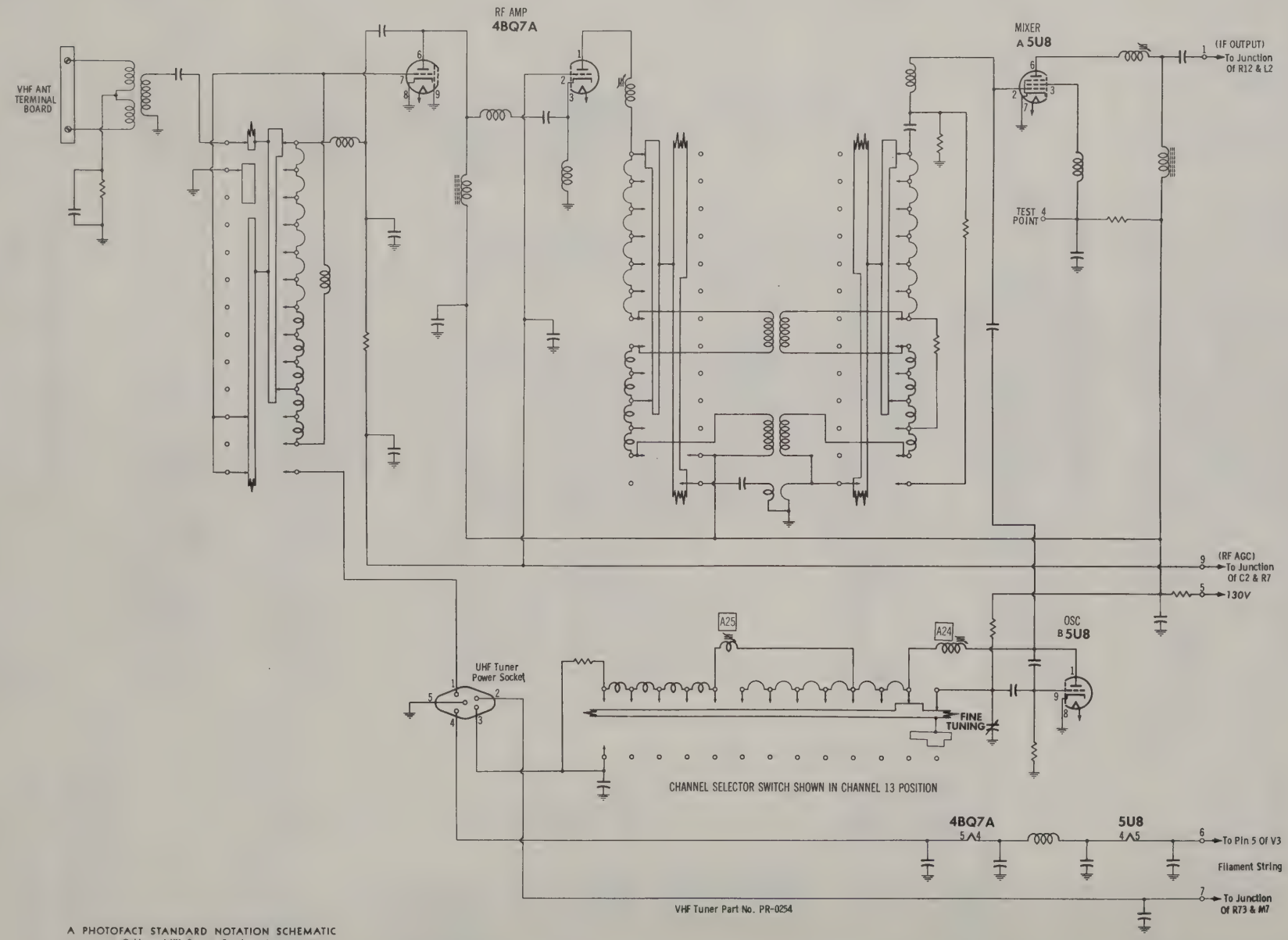

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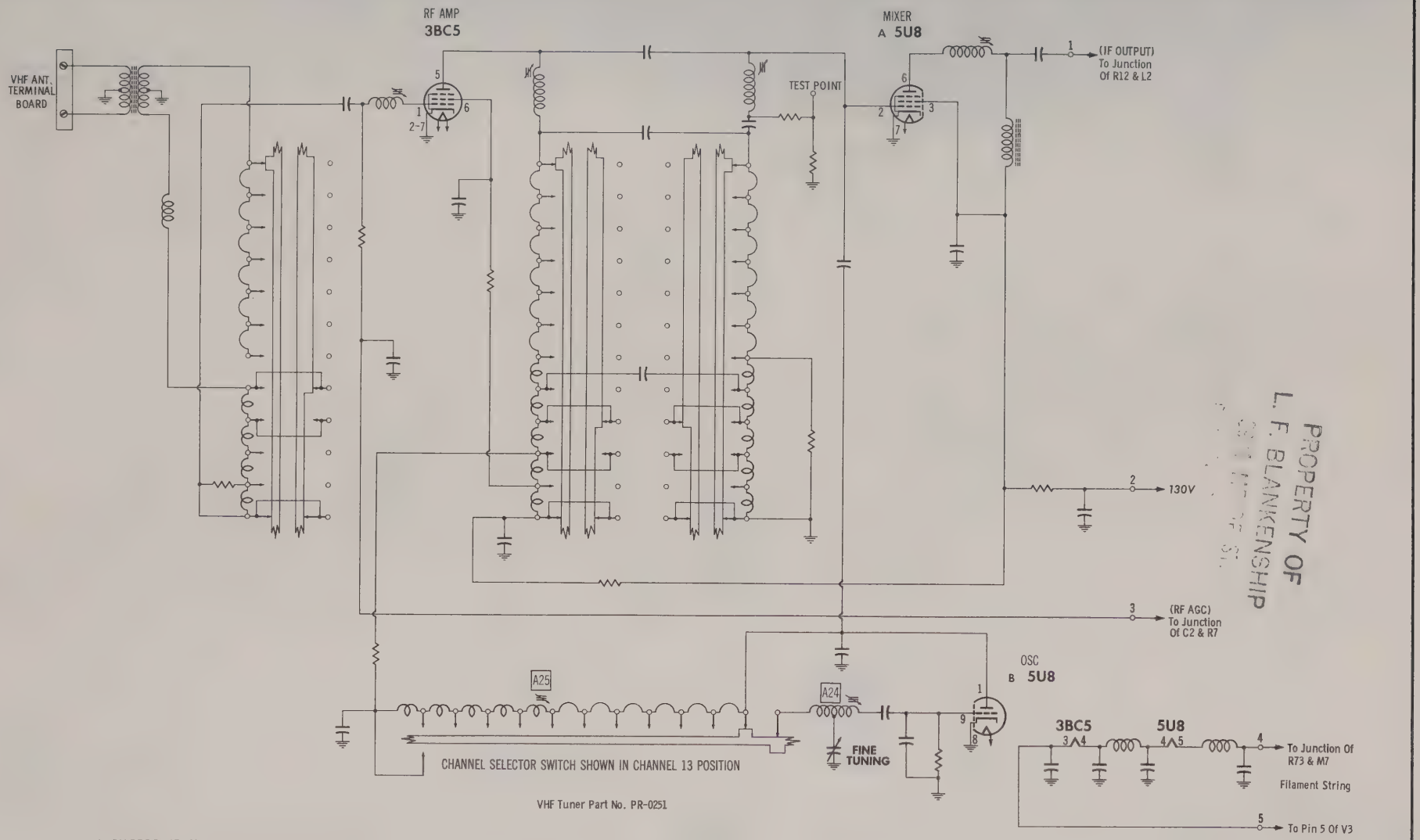

VHF Tuner Part No. PR-0251

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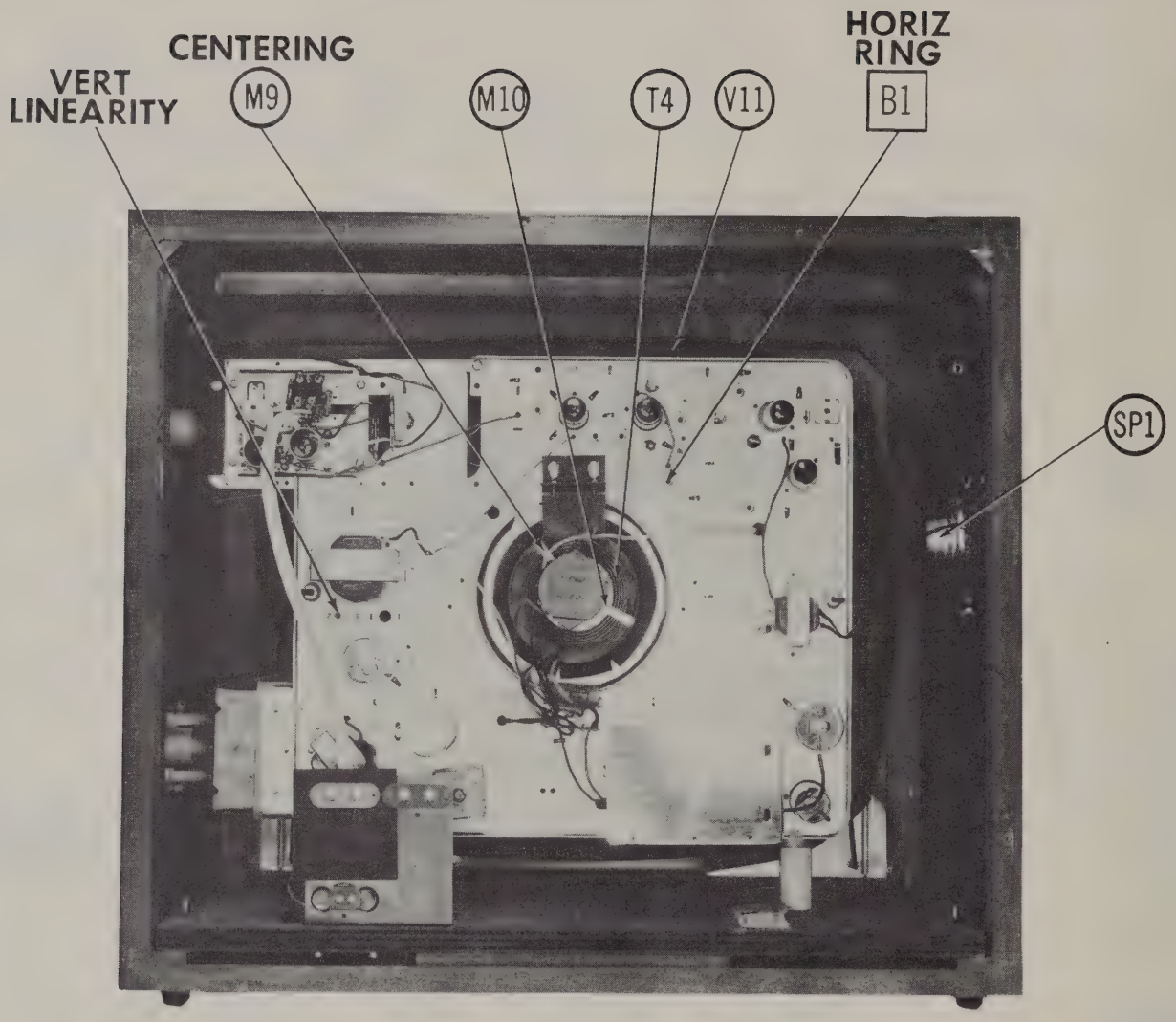

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Allow time for the receiver to warm up.

1. Adjust the set for a normal picture with less than over contrasty picture.

2. Connect a clip lead across the ringing coil (L18).

3. Connect a clip lead from point Ⓕ to chassis.

4. Adjust the horizontal hold control for a single picture.

5. Remove the clip lead from across the ringing coil and adjust the ringing coil slug (B1) with the core entering the coil from the chassis side until a single picture is attained. Then back off 1/4 turn counter clockwise for final adjustment of this coil.

6. Remove the clip lead from point Ⓕ and the picture will snap into sync.

7. Set the horizontal hold control to its maximum clockwise position and turn slowly counter clockwise until the picture is in sync. This is the proper setting of the horizontal hold control and should maintain sync for any signal level.

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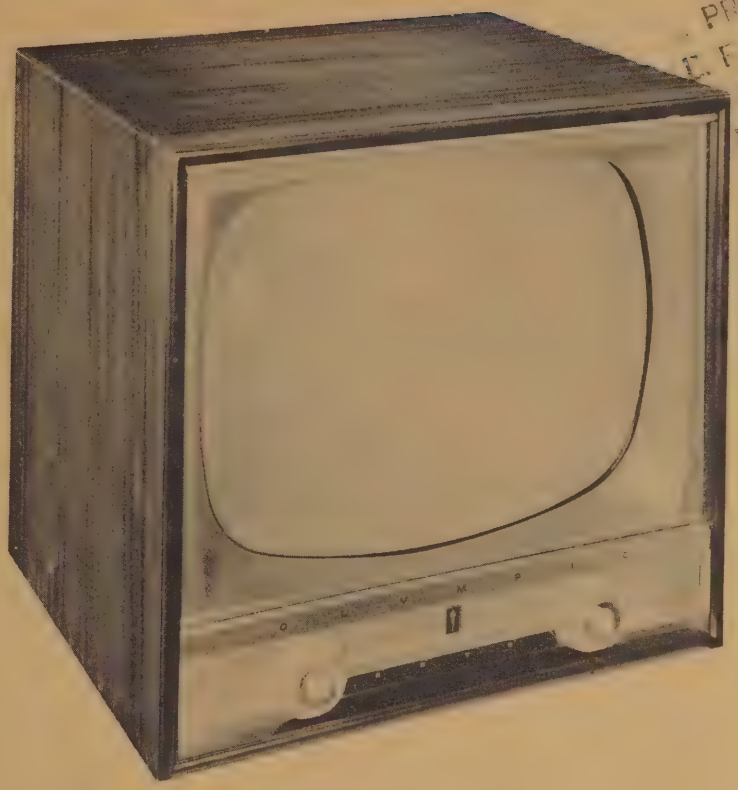

OLYMPIC MODELS 1CL22U, 1CL23U, 1CM24U, 1CM25U, 1KL41U, 1KL42U, 1KL43U, 1TL12U, 1TM13U, 4CR26U, 4CR27U, 4CS28U, 4CS29U, 4KR44U, 4KR45U (Ch. CL, CM, CR, CS)

OLYMPIC MODEL 1TL12U (Ch. "CL")

TRADE NAME	Olympic	MODELS	CHASSIS
		1CL22U, 1CL23U, 1KL41U, 1KL42U, 1KL43U, 1TL12U	"CL"
		1CM24U, 1CM25U, 1TM13U	"CM"
		4CR26U, 4CR27U, 4KR44U, 4KR45U	"CR"
		4CS28U, 4CS29U	"CS"
MANUFACTURER	Olympic Radio & Television, Inc., 34-01 38th Ave., Long Island City 1, N. Y.		
TYPE SET	Television Receiver		
TUBES	Eighteen		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING 1.62 Amp. @ 117 Volts AC	
TUNING RANGE -	Channels 2 thru 13 VHF, 14 thru 83 UHF,	Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from front panel of cabinet.
2. Remove 2 wood screws holding name plate to front of cabinet. Remove 4 small push-on type control knobs.
3. Remove 2 metal screws. Remove rear cover.
4. Disconnect speaker plug.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 2 speaker nuts. Remove speaker.

MODEL	CHASSIS
1TL12U	"CL"

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of VHF tuner oscillator adjustments, it is necessary to remove the chassis from the cabinet. (See Disassembly Instructions.)

PICTURE TUBE SAFETY GLASS CLEANING

Remove the 3 wood screws holding wood molding at the top edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See Tube Placement Chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal frequency slug may be made from the rear panel of the receiver. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the buzz control R8 for maximum sound and MINIMUM buzz.

FUSES

One fuse is used for Horiz. Sweep Circuit protection. (For location see Tube Placement Chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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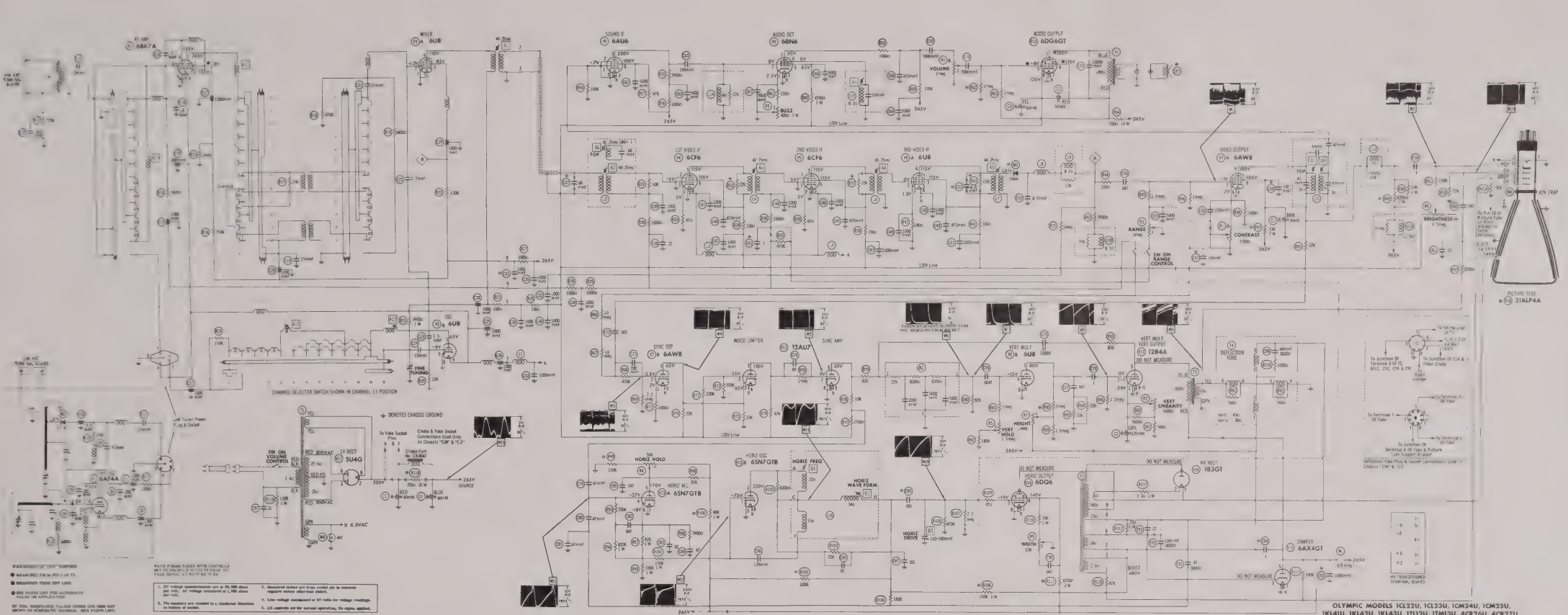
OLYMPIC MODELS 1CL22U, 1CL23U, 1CM24U, 1CM25U, 1KL41U, 1KL42U, 1KL43U, 1TL12U, 1TM13U, 4CR26U, 4CR27U, 4CS28U, 4CS29U, 4KR44U, 4KR45U (Ch. CL, CM, CR, CS)
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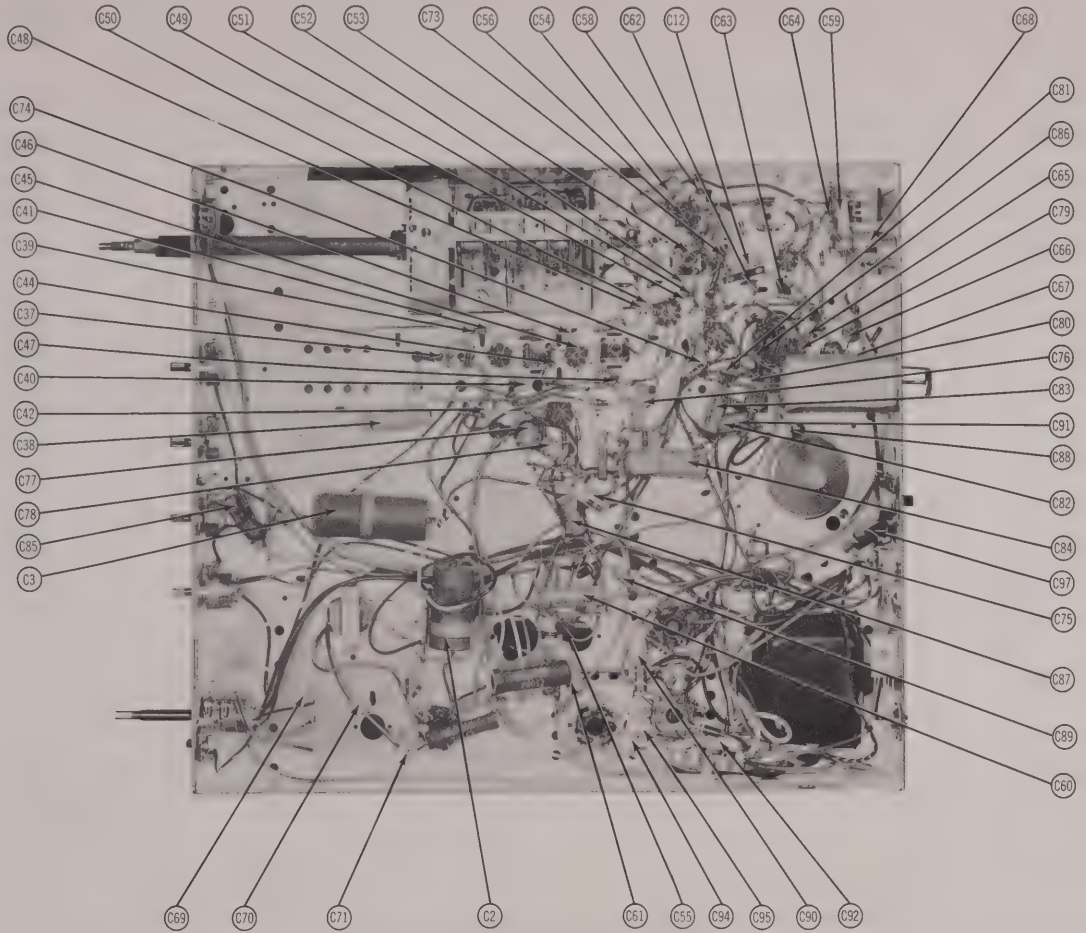
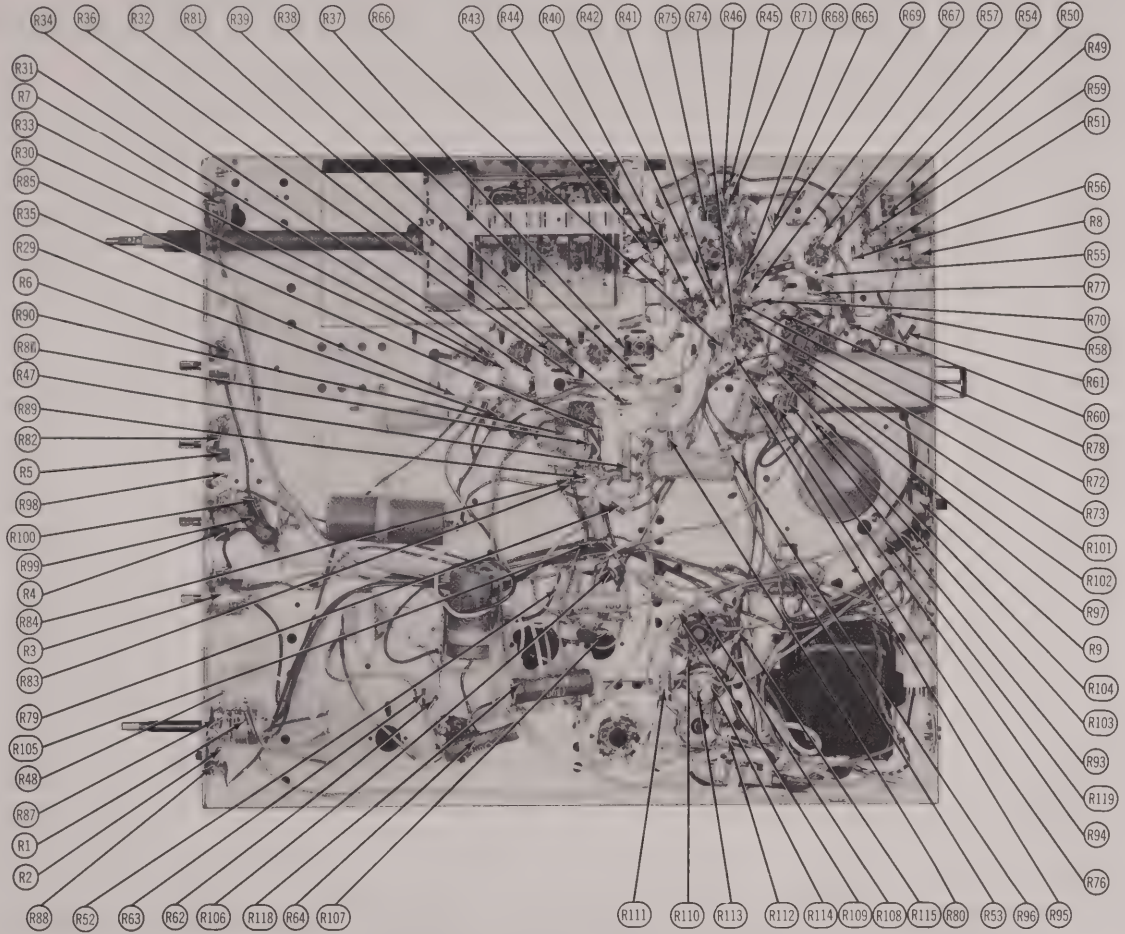


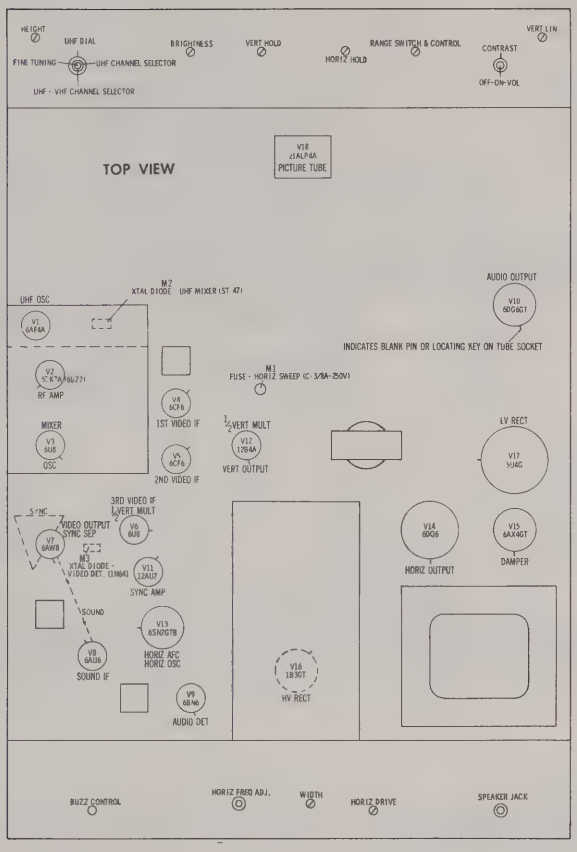
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

OLYMPIC MODELS 1CL22U, 1CL23U, 1CM24U, 1CM25U, 1KL41U, 1KL42U, 1KL43U, 1TL12U, 1TM13U, 4CR26U, 4CR27U, 4CS28U, 4CS29U, 4KR44U, 4KR45U (Ch. CL, CM, CR, CS)



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V17

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, V10, (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V7, V18
Has pic, no sound - V8, V9, V10

SYNC FAILURE
No vert. sync - V6, V11, V12
No horiz. sync - V11, V13
No vert. or horiz. sync - V7, V11

SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V18, Fuse (M1)
No vertical deflection - V6, V12
Poor vert. linearity or foldover - V6, V12
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V16, V17
Vert. off freq. - V6, V11, V12
Horiz. off freq. - V11, V13

OLYMPIC MODELS 1CL22U, 1CL23U, 1CM24U, 1CM25U, 1KL41U, 1KL42U, 1KL43U, 1TL12U, 1TM13U, 4CR26U, 4CR27U, 4CS28U, 4CS29U, 4KR44U, 4KR45U (Ch. CL, CM, CR, CS)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V12) from its socket to disable the high voltage.

VIDEO I.F. ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield (coming over converter tube. Low side to chassis.	44.25MC	9	DC probe thru 100K to point Ⓐ. Common to chassis.	A1, A2	Adjust for maximum deflection. Use only enough generator output to provide usable indication on VTVM.
2.	"	"	43.75MC	"	"	A3	"
3.	"	"	43.25MC	"	"	A4	"
4.	"	"	44.75MC	"	"	A5	"
5.	"	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to ungrounded tube shield (coming over converter tube. Low side to chassis.	44.25MC (30MC Swp)	41.25MC 43.25MC 44.1MC 45.75MC	9	Vert. amp thru detector probe (Fig 1) to pin 1 (grid) of 6CF6 (V5).		Check for response curve similar to Fig. 2, with markers positioned as indicated. If necessary, retouch A1 and A3 for desired response.
7.	"	"	"	41.25MC 42.5MC 43.75MC	"	Vert. amp thru 100K to point Ⓐ. Low side to chassis.		Check for response curve similar to Fig. 3 with markers as shown. If necessary, retouch A3, A4 and A5 to obtain desired response.

4.5MC TRAP ALIGNMENT

Set the contrast control for maximum contrast. Remove 6CF6 (V5) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.05MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (unmod)	Any	DC probe thru detector (Fig. 6) to pin 11 (cathode) of picture tube. Common to chassis.	A7	Adjust for MINIMUM deflection. Use maximum signal generator output. Replace V5 in its socket.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Connect the DC probe of the VTVM to pin 1 (grid) of 6BN6 (V9), common to chassis. Turn the set on and tune in a strong TV signal. Adjust A8 for maximum deflection on the VTVM. Disconnect the VTVM from the receiver. Set the bass control (R6) to its mid-range position. Adjust the quadrature coil slug (A9) for maximum volume. Adjust R8 for maximum volume and minimum buzz. Retouch A8 for maximum volume.

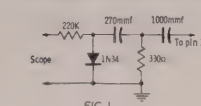


FIG. 1

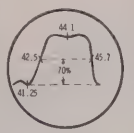


FIG. 2

FIG. 3

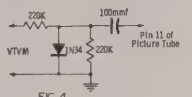


FIG 4

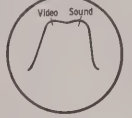


FIG.5

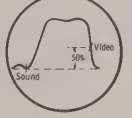


FIG.6

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C38.
Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 1200 carbon resistors	Across antenna terminals with 1200Ω in each lead.	213MC (10MC Swp)	210.25MC 215.75MC	13	Vert. amp thru 10K to point Ⓑ. Low side to chassis.	A10, A11	Adjust for response curve similar to Fig. 5 with markers above 90%.

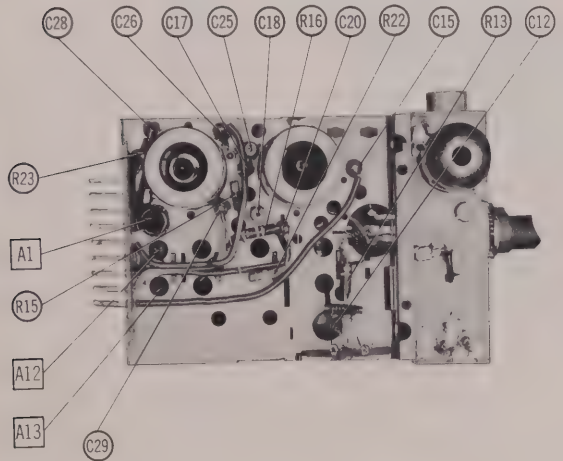
VHF OSCILLATOR ALIGNMENT

Leave bias connected as under "VHF RF and Mixer Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

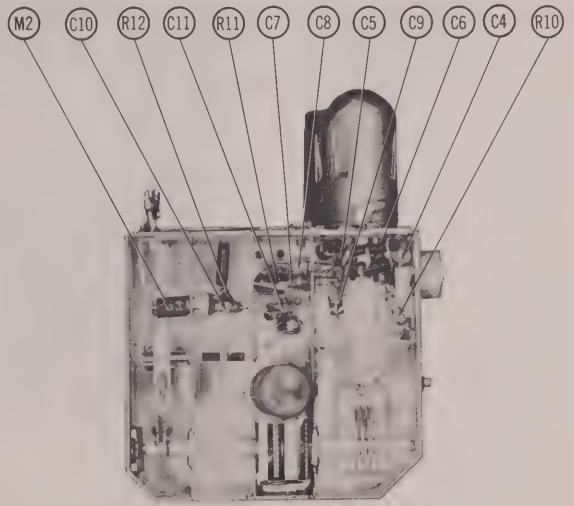
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 150Ω carbon resistors	Across antenna terminals with 150Ω in each lead.	213MC (10MC Swp)	210.25MC 215.75MC	13	Vert. amp thru 50K to point Ⓐ. Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should fall at 50%.
11.	"	"	88MC (10MC Swp)	83.25MC 87.75MC	6	"	A13	"

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



RF TUNER TOP VIEW



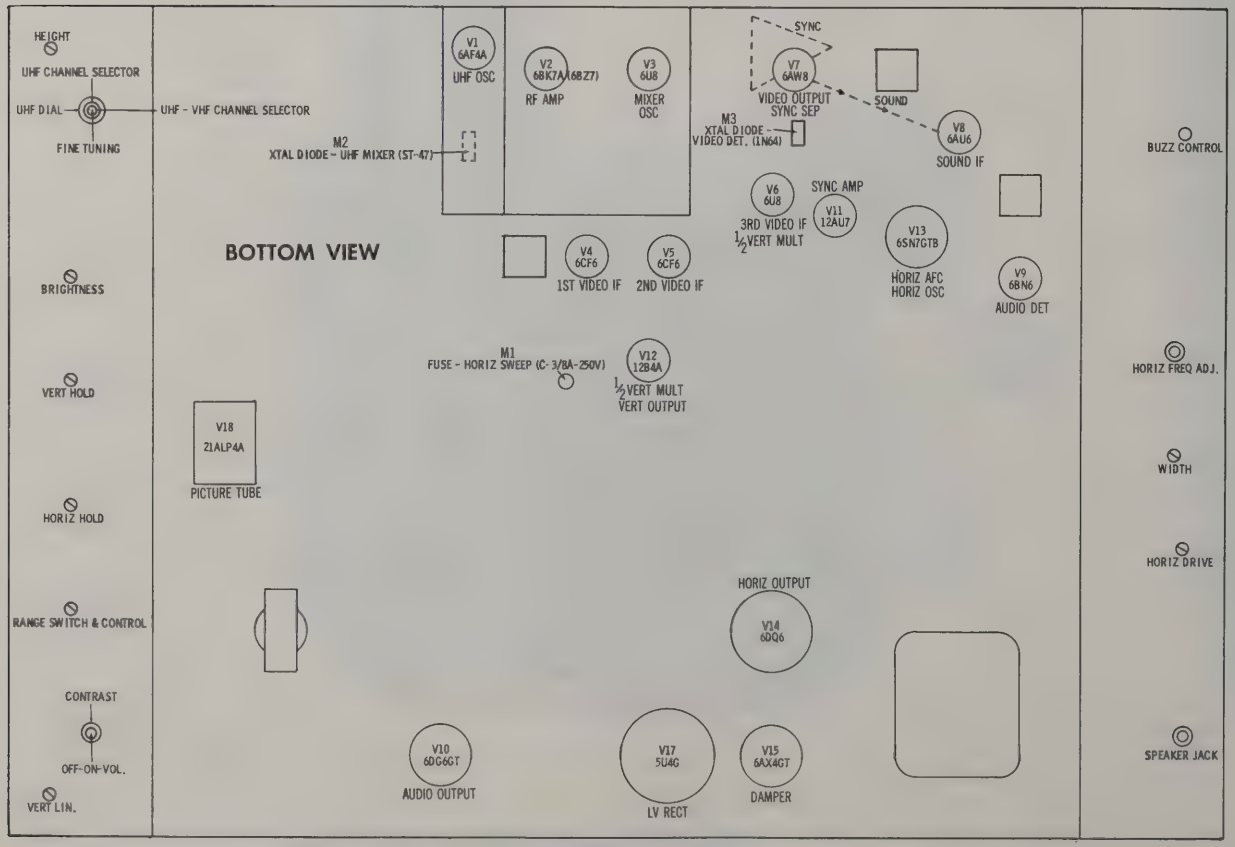
UHF TUNER FRONT VIEW

OLYMPIC MODELS TCL22U, TCL23U, 1CM24U, 1CM25U, 1KL41U, 1KL42U, 1KL43U, 1TL12U, 1TM13U, 4CR26U, 4CR27U, 4CS28U, 4CS29U, 4KR44U, 4KR45U (Ch. CL, CM, CR, CS)

RESISTANCE MEASUREMENTS

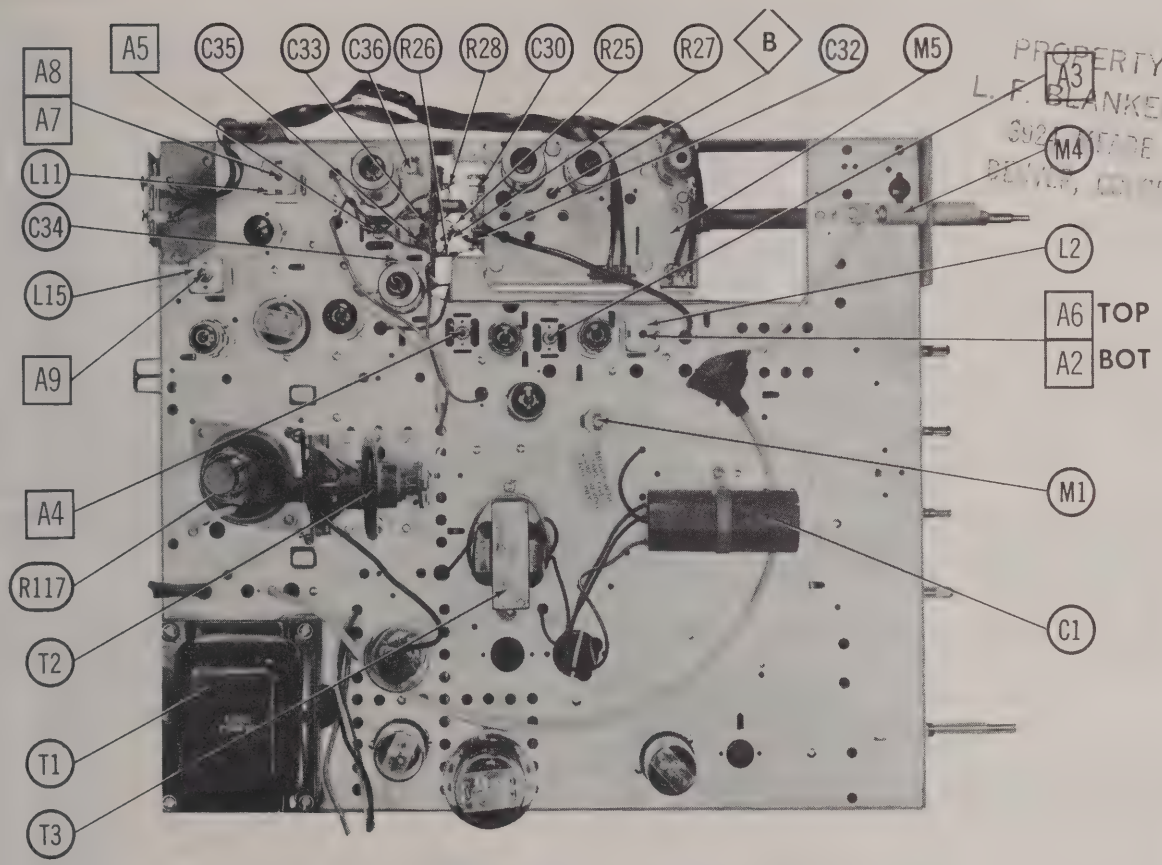
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AF4A	■ ǂ5000Ω	6800Ω	.1Ω	0Ω	0Ω	6800Ω	■ ǂ5000Ω		
V2	6BK7A	† 1200Ω	400K	INF	.1Ω	0Ω	INF	1Meg	0Ω	0Ω
V3	6U8	■ 4000Ω	470K	† 120K	.1Ω	0Ω	■ 430Ω	0Ω	0Ω	15K
V4	6CF6	1Meg	47Ω	0Ω	.1Ω	■ 330Ω	■ 330Ω	0Ω		
V5	6CF6	1Meg	47Ω	.1Ω	0Ω	■ 330Ω	■ 330Ω	0Ω		
V6	6U8	● *1.5Meg	.1Ω	■ 330Ω	.1Ω	0Ω	■ 330Ω	180Ω	0Ω	● 1.5Meg
V7	6AW8	1000Ω	2Meg	■ 20K	0Ω	.1Ω	●40Ω	600K	† 33K	† 5000Ω
V8	6AU6	100K	0Ω	.1Ω	0Ω	† 5000Ω	† 47K	0Ω		
V9	6BN6	● 350Ω	8Ω	.1Ω	0Ω	■ 4700Ω	8.2Ω	† 330K		
V10	6DG6GT	TP	0Ω	† 1000Ω	† 900Ω	500K	NC	.1Ω	30K	
V11	12AU7	■ 47K	100K	■ 20K	.1Ω	.1Ω	■ 13K	1Meg	0Ω	0Ω
V12	12B4A	● 1500Ω	2.2Meg	0Ω	.1Ω	.1Ω	TP	2.2Meg	TP	† 850Ω
V13	6SN7GTB	500K	† 70K	0Ω	1.5Meg	† 50K	400K	0Ω	.1Ω	
V14	6DQ6	TP	0Ω	TP	† 7500Ω	300K	TP	.1Ω	0Ω	TOP CAP *40Ω
V15	6AX4GT	NC	NC	100K	NC	† 200Ω	NC	.1Ω	0Ω	
V16	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			TOP CAP *620Ω
V17	5U4G	NC	20K	TP	25Ω	TP	28Ω	NC	20K	
V18	21ALP4A	0Ω	22K	Pin 6 0Ω	Pin 10 *47K	Pin 11 ● ■ 300K	Pin 12 .1Ω			

RANGE SWITCH SET FULLY AT COUNTER CLOCKWISE POSITION.
ǂ MEASURED IN "UHF" POSITION.
■ MEASURED FROM 120V LINE.
† MEASURED FROM PIN 2 OF V17.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
* MEASURED FROM PIN 3 OF V15.
TP TIE POINT
NC NO CONNECTION

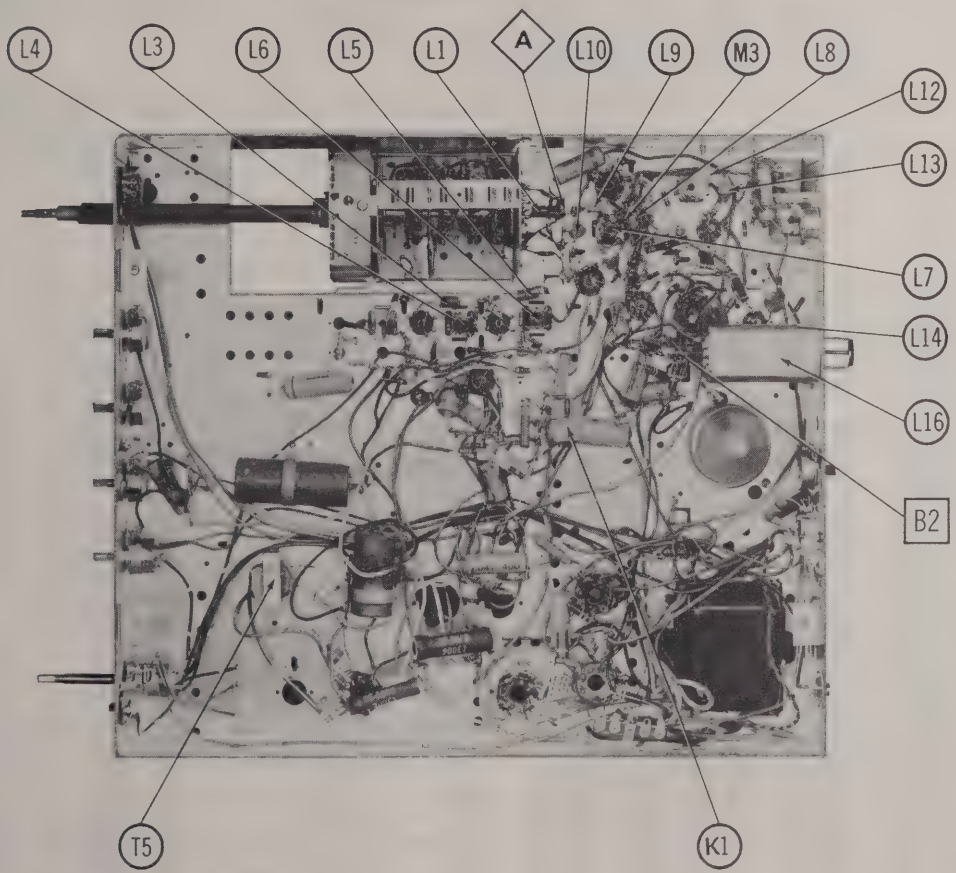


TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
392[illegible] ST.
[illegible]



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Osc.	6AF4A	
V2	HF Amp.	6BH7A	Note 1
V3	Mixer-Osc.	6U8	
V4	1st Video IF Amp.	6CB6	
V5	2nd Video IF Amp.	6CB6	
V6	3rd Video IF Amp.	6CB6	
V7	Video Det., 1st Video Amp., Sync Sep.	6U8	
V8	Video Output	6BK7A	
V9	Sound IF Amp.	6AU6	
V10	Audio Det.	6BN6	

ITEM No.	USE	TYPE	NOTES
V11	Audio Output	6DQ6B	
V12	Sync Amp.	12AL7	
V13	Vert. Multi. Vert. Oscillator Vert. Output	12BH7A	
	Noise AFC Horiz. Osc.	6BN8/6U8	
V14	Horiz. Output	6DQ6	
V15	Damper	1B3GT	
V16	HV Rectifier	5U4G	
V17	LV Rectifier		

Note: 6BZ7 may be used in some versions

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: GE OLYMPIC PART No.	GE CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V18	21ALP4A ①	21ALP4A ①	21ALP4A ①	21ALP4A/B ①	① Aluminized ② Silver Screen -85
		21ALP4A/B ①		21ALP4A/B ②	
	24CP4A ①	21ALP4	21AL24		
		24CP4A ①	24CP4A ①	24CP4A ②	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	350	CO3300	PR3-035	BR340	WT400		D-175 MT-3508	R3069P
B	60	350			BR435				
C	4	350							
C2A	50	350	CO3908-1	PR3809B0	BR3S05	TS-50	SD-80-380	FM-3540	TVA-1715
B	50	350	CO3856	PR2-300	BO576	WD340		T-535	R3064*
C	3	25							

* Non catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	1.5									
C5	300									
C6	1000		EF-001	MPT-1000					503C-D1	
C7	1000		EF-001	MPT-1000					503C-D1	
C8	1000									
C9	9.3									
C11	18		N750-D15	TCN-15	N021	N750K-150			5TCU-Q45	
C12	470		BPD-00047	CD-471	K080	BU-471	UC-5847		5GA-T47	
C13	10		MP0-EI10	TCZ-10	Z010	MP0K-100			5TCC-Q1	
C14	10			TCZ-10	Z023	MP0K-100				
C15	1000									
C16	2.7									
C17	1000									
C18	1000									
C19	15		NP0-D15	TCZ-15	Z021	NP0K-150			5TCC-Q15	
C20	1000									
C21	15		NP0-D15	TCZ-15	Z021	NP0K-150			5TCC-Q15	
C22	1000									
C23	L.3									
C24	L.3									
C25	L.5									
C26	10									
C27	1000									
C28	1000									
C29	1000									
C30	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C31	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	Note 1
C32	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C33	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C34	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C35	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C36	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C37	68			TCZ-68	Z039	NP0-337-680			5TCC-Q68	Note 1
C38	22	200	CO-H-2224	P288N-22	CUB2P22			PT4022	2TM-P22	
C39	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C40	470		CC431E	1464-00047	BR3T47		MS-347		5HK-D1	
C41	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C42	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C43	1.5	400	CO-B-4104	P488N-15	CUB4P1			PT401	4TM-P1	Note 3
C44	1000		CCD122X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C45	470		CC431K	1464-00047	BR3T47		MS-347		5HK-D1	
C46	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C47	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C48	470		CC431K	1464-00047	BR3T47		MS-347		5HK-D1	
C49	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C50	1000		CCD102X	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C51	1000		CCD102X	BPD-001	DD-103	K069	801-001	DC521	5HK-D1	
C52	6.8			CO-EL6.8	TCZ-6R8	Z013	MP0A-6R8		2TCC-V68	Note 1
C53	4.7		CO-1063	MP0-4T7	TCZ-4R7	TZ07	NP0A-4R7	2T-5547	5TCC-P-V47	
C54	047	400	CO-B-4473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C55	1000		CCD102X	BPD-001	DD-102	K080	81J-005	DC525	5HK-D5	
C56	220		CC221M	D1-00022	DD-221	G051	81J-221	UC-5322	5GA-T22	
C57	100		CC101M	D1-00010	DD-100	G058	8J-101	2T-542	5TCC-Q10	
C58	330		CC331M	BPD-00033	DD-331	G056	8J-331	UC-5333	5GA-T33	Note 2
C59		400	CO-H-4104	P488N-1	CUB4P1			PT4101	4TM-P1	
C60	047	400	CO-H-4473	BPD-05	DF-503			PT4147	4TM-S47	
C61	22	400	CO-H-4203	BPD-02	DF-203	CUB4S2	81T-02	PT423	4TM-S23	
C62	5000		CCD502X	BPD-005	DD-502	K080	81J-005	DC525	5HK-D5	
C63	5000		CCD502X	BPD-005	DD-502	K080	81J-005	DC525	5HK-D5	
C64	1000		CCD102X	BPD-001	DD-102	K080	801-001	DC521	5HK-D1	
C65	330		CC333K	BPD-00033	DD-331	G056	8J-331	UC-5333	5GA-T33	
C66	5000		CCD502X	BPD-005	DD-502	K080	81J-005	DC525	5HK-D5	
C67	5000		CCD502X	BPD-005	DD-502	K080	81J-005	DC525	5HK-D5	
C68	470		CC471M	BPD-00047	DD-471	K080	8U-471	UC-5547	5GA-T47	
C69	5000		CCD502X	BPD-005	DD-502	K080	81J-005	DC525	5HK-D5	
C70	5000		CCD502Z	BPD-006	DD-502	K080	81J-005	DC525	5HK-D5	
C71	10000		CCD103Z	BPD-01	DD-103	K080	8U-01	DC511	5HK-E5	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C73	.003	600	CO-E-6302	DI-003	DE-303	CUB6D2	GP2-333-302	PT623	6TM-D2	
C73	330		CCD331M	DI-00033	DD-331	G056	8U-331	UC-5333	5GA-T33	
C74	.02	400	CO-D-4203	BPD-05	DF-503	CUB4S5	81T-02	PT423	4TM-S2	
C75	.01	1000	CO-O-X103	PI03EN-01	DD-103	CUB1E01		PT1E01	1TM-S1	
C76	.0047	600	CO-O-4473X	1484-0047			JRSD-1		36D-347	
C77	.047	400	CO-H-4473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C78	.1	400	CO-H-4104	P488N-1	DF-104	CUB4P1		PT4101	4TM-P1	
C79	.47	600	CO-E-6474	MP0-6147	TCZ-47	22R5Q47	NP0-338-470	2T-5447	5TCC-Q47	
C80	47	500	RCM15C470X	MP0-5147	TCZ-47	22R5Q47	NP0-338-470	2T-5447	5TCC-Q47	
C81	47	500	RCM15C470X	MP0-5147	TCZ-47	22R5Q47	NP0-338-470	2T-5447	5TCC-Q47	
C82	.047	400	CO-H-4473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C83	.68	400	CO-H-6304	BPD-03	DF-303	CUB4S3	81T-03	PT403	4TM-S3	
C84	.47	300	CO-E-5474	P288N-47		CUB2P47		PT4047	2TM-P47	
C85	.047	600	CO-H-4473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C86	120	500	RCM20C121X	MP0-5120	TCZ-120	22R3Y12	NP0-333-121		5TCC-T12	
C87	.001	600	CO-O-6102K	1484-0001			JRSD-1	81I-102	MCB255	MS-2L
C88	.01	600	CO-D-6103							
C89	.001	600	CO-O-6102K	1484-0001			JRSD-1	81I-102	MCB255	MS-2L
C90	.047	400	CO-H-4473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	Note 4
C91	.47	3000	CO-G-4353							
C92	.33	300	CO-B-3324	P288N-33		CUB2P33		PT4033	2TM-P33	
C93	1000		CCD102X	BPD-001	DD-102		MB8-1	801-001	DC521	5HK-D1
C94	.1	400	CO-H-4104	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	Note 3
C95	100	4000	CO-4545	BYD-50-101		VY521	5KV-101		50GA-T1	
C96	68	3000	CO-4530	BYD-30-68	DD30-680	VY3G68	3KV-680	DC30468	30GA-Q68	
C97	.01	600	CO-D-6103	BPD-01	DE-103	CUB6S1	GP3-335-103	PT61I	6TM-B1	

Note 1: Not used in some versions.
Note 2: Some versions use .0000MMF in this application. (part no. CCD102X).
Note 3: Some versions may use 470MMF in this application. (part no. CO-H-4224).
Note 4: Chassis CR and CS use .22MFD in this application. (part no. CO-H-4224).
Note 5: Chassis CR and CS use 6810MMF in this application. (part no. XCM20A681M).

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: OLYMPIC	CENTRALAB	CLAROSTAT	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500 Ω		PT4080	F1-T	R1V-546		UV152R	Contrast (Panel)
B	1Meg		Not Reg.	R2-58			UR6BA	Volume (Rear)
C	Switch		Not Reg.	KB-1			US-28	Attach to R1B
R2A ‡	500Ω		PT2161 ①	RX-10	A47-5000-6	Q11-114	TA5RL	Vert. Linearity
B	Shaft		Not Reg.	Not Reg.	FXB-1/4	JSQ	Not Reg.	Attach to R2A
R3A	3Meg	½	PT4328	AB-54	A47-3Meg-8		U59	Range
B	Shaft		Not Reg.	AK-4	KB8-3		Not Reg.	Attach to R3A
C	Switch		Not Reg.	KB-3	SWS-21		U35	Attach to R3A
R4A	50K	½	PT-3811	AB-51	A47-50K 8	Q11-123	Not Reg.	Horiz. Hold
B	Shaft		Not Reg.	AK-4	KB8-3	Not Reg.	Not Reg.	Attach to R4A
R5A	1. 5Meg	½	PT3561 ①	AB-742	A47-1.5Meg-8	Q11-139	U155	Vert. Hold
B	Shaft		Not Reg.	AK-4	KB8-3	Not Reg.	Not Reg.	Attach to R5A
R6A	1. 5Meg	½	PT3561 ①	AB-742	A47-1.5Meg-8	Q11-138	U156	Brightness
B	Shaft		Not Reg.	AK-4	KB8-3	Not Reg.	Not Reg.	Attach to R6A
R7A	1Meg	½	PT3663 ①	BX-69	A47-1Meg-8	Q11-137	TA1EL	Height
B	Shaft		Not Reg.	Not Reg.	FXB-1/4	JSQ	Not Reg.	Attach to R7A
R8	400Ω	3	PT3811		39-500		27L-000	Bass (Wire-wound)
R9	10K	1	PT4329				TA4IL	Width

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: OLYMPIC PART No.	IRC PART No.	NOTES
R10	6800Ω			BTS-6800	
R11	1000Ω			BTS-1000	
R12	180Ω			BTS-180	
R13	220K			BTS-220E	
R14	5850Ω			BTS-5900	
R15	1Meg			BTS-1Meg	
R18	750K			BTS-750K	
R17	15K			BTS-15K	
R18	470K			BTS-470K	
R19	6800Ω			BTS-6800	
R20	15K			BTS-15K	
R21	3900Ω	1		BTA-3900	
R22	120K			BTS-120K	
R23	100Ω			BTS-100	
R24	150K			BTS-150K	
R25	1Meg		RE1015M	BTS-1Meg	
R26	1000Ω		RE1001M	BTS-1000	
R27	1000Ω		RE1001M	BTS-1000	
R28	330Ω		RE331M	BTS-330	
R29	1000Ω		RE1001M	BTS-1000	
R30	1000Ω		RE1009M	BTS-1000	
R31	10K		RE103K	BTS-10K	Note 1
R32	22K		RE223K		
R33	47Ω		RE470M	BTS-47	
R34	330Ω		RE331M	BTS-330	
R35	470K		RE474M	BTS-470K	
R36	1000Ω		RE1001M	BTS-1000	
R37	22K		RE223K		Note 2
R38	330Ω		RE331M	BTS-330	
R39	47Ω		RE470M	BTS-47	
R40	15K			BTS-15K	Note 2
R41	330Ω		RE331M	BTS-330	
R42	180Ω		RE181K	BTS-180	
R43	3900Ω		RE393K	BTA-3900	
R44	220Ω		RE221M	BTS-220	
R45	1.5Meg		RE1015K	BTS-1.5Meg	
R46	1.5K		RE105K	BTS-1.5K	
R47	33K	2	RE333M	BTH-33K	Note 3
R48	15000		RE153M	BTS-150K	
R49	8200Ω	2	RE822K	BTH-8200	Note 4
R50	10K		RE103K	BTS-10K	
R51	150K		RE154K	BTS-150K	
R52	2700Ω		RE272K	BTS-2700	
R53	22K		RE223K	BTS-22K	
R54	100K		RE104M	BTS-100K	
R55	3900Ω		RE393K	BTS-3900	
R56	1000Ω		RE102M	BTS-1000	
R57	47K		RE473M	BTS-47K	
R58	1000Ω		RL1002M	BTS-1000	
R59	330K		RE334K-A	BTS-330K	
R60	47000Ω	1	RE473M	BTA-4700	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: OLYMPIC PART No.	IRC PART No.	NOTES
R61	150Ω		RE151M	BTS-150	
R62	1Meg		RE1015K	BTS-1Meg	
R63	1Meg		RE1015K	BTS-1Meg	
R64	700Ω	10	RE3959	1.3, 4A-700	
R65	22K		RE223M	BTS-22K	
R66	10Meg		RE1019M	BTS-10Meg	
R67	10Meg		RE1019M	BTS-10Meg	
R68	470K		RE474M	BTS-470K	
R69	2.5Meg		RE825M	BTS-2.5Meg	
R70	22K		RE223K	BTS-22K	
R71	1090Ω		RE1091M	BTS-1090	
R72	220K		RE224K	BTS-220K	
R73	220K		RE224K	BTS-220K	
R74	47K		RE473K	BTS-47K	
R75	33K		RE333K	BTS-33K	
R76	1Meg 5%		RE1015M	BTS-1Meg 5%	
R77	2700Ω		RE272K	BTS-2700	
R78	10K		RE103K	BTS-10K	
R79	82K		RE823K	BTS-82K	
R80	82K		RE823K	BTS-82K	
R81	1Meg		RE1015K	BTS-1Meg	
R82	1Meg		RE1015K-A	BTS-1Meg	
R83	33K		RE333K	BTS-33K	
R84	22K		RE223K	BTS-22K	
R85	82K		RE823K	BTS-82K	
R86	2.2Meg		RE825K	BTS-2.2Meg	
R87	560Ω		RE561K	BTS-560	
R88	5800Ω		RE583M	BTS-5800	
R89	1.5Meg		RE1015K	BTS-1.5Meg	
R90	1Meg		RE1015M	BTS-1Meg	Note 6
R91	560Ω		RE561K	BTS-560	
R92	560Ω		RE561K	BTS-560	
R93	330K		RE334K-A		
R94	820K		RE824K-A		
R95	330K	1	REC324J-A		
R96	3900Ω		RE393K	BTS-3900	
R97	82K 5%	1	REC823J-A		
R98	82K		RE823K	BTS-82K	
R99	150K		RE154K-A		Note 7
R100	68K	1	REC683K-A		Note 8
R101	150K 5%		REC154J-A		
R102	8200Ω		RE822K		
R103	22K		RE223M		
R104	180K		RE184K-A		
R105	100K	1	REC104K-A	BTA-100K	Note 9
R106	150K	1	REC154K-A		Note 10
R107	2.2Meg		RE225K		
R108	470K		RE474K	BTS-470K	
R109	470		RE470M	BTS-47	
R110	33K		RE333M		
R111	8200Ω	2	RED822K		Note 11

RESISTORS (cont)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: OLYMPIC PART No.	IRC PART No.	NOTES
R112	330	1	RE-C330M	BTS-330	
R113	100K	1	RE1004K-A		
R114	330K		RE334K-A		
R115	47K		RE473M	BTS-47K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: OLYMPIC PART No.	IRC PART No.	NOTES
R116	10000		RE-B103K		
R117	3.3Ω	1	RE4419	BW1-3.3	
R118	2000	20	RE3569	2D-200	Note 12
R119	100K	1	REC104M	BTA-100K	

Note 1: Some versions use 5600Ω in this application. (part #RE5623K)
Note 2: Not used in some versions.
Note 3: In chassis CR and CS 47K, 2W is used in this application. (part #RED473M)
Note 4: In chassis CR and CS 10K, 2W is used in this application. (part #RED103K)
Note 5: In chassis CR and CS 820K, 1W is used in this application. (part #RECE824K-A)
Note 6: Some versions use 1.5Meg in this application. (part #RE815K)
Note 7: In chassis CR and CS 330K is used in this application. (part #RE334K-A)
Note 8: In chassis CR and CS 47K, 1W is used in this application. (part #REC473K-A)
Note 9: In chassis CR and CS 150K is used in this application. (part #RE154K-A)
Note 10: In chassis CR and CS 100K, 1W is used in this application. (part #REC104K-A)
Note 11: In chassis CR and CS 12K, 1W is used in this application. (part #RED123K)
Note 12: Not used in chassis CR and CS

TRANSFORMER (POWER)

ITEM No.	USE	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	H.T.V.AC	580VCT	5V	6.3V		TR3621-1	P-8733	P-8754			
	A-1.52A	A-.220A	A-3A	A-6A							

① Tape 6.3V, 1.2A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Horiz. Output Trans.	TR3599-3	FB41-1 ①	HVO-2* ①	225T* ①	X080* ①	A-8256* ②	FLY-14* ①	D-19* ①
T3	Vert. Output Trans.	TR3585	21803	A-3036	204T9 ①	V309	A-8123	26881	A-ULX
T4A	Yoke (90°)	P7007 ②	MDF-92	233D1 ②	TY6019/43 ②	CL-3900	DY-18A	T-18 ②	Y-4-1
B	Vert (413MS)								

① Drill new mounting hole(s).
② Connect brite, yoke damping network across terms #3 and #7. Use original if necessary.
* This part may be superseded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original With Civil Unions Replacement Types As Noted

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	9	9	9	9	9	9	9	9
	8	8	8	8	8	8	8	8
	6	6	8	8	7	7	7	7
	2 & 3	3	3	3	3	3	3	3
	1	1	1	1	1	1	1	1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	2K	2-4Ω	TR2706-1	21001	A-3025	A-3332	26858 ①	S-12X	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: OLYMPIC PART No.	QUAM PART No.	RCA PART No.	NOTES
SP1	5"	PM	3-4Ω	SK1783-2 ①	5A07	20582	① Used in model 17L12U, 17M13U & 4CR24U.
	5"	PM	1L 7Ω	SK3147-1 ②	5A15T		② Used in models 1KL42U, 1KL43U, 4KR44U & 4KR45U.
	8"	PM	3-4Ω	SK3148-1 ③	8A31	22561	③ Used in models 1KL42U, 1KL43U & 4KR44U.
	8"	PM		SK3891 ④			④ Used in model 1CL22U.
	8"*	PM	3-4Ω	SK1906-2 ⑤	8A21	22481	⑤ Used in models 1CL32U, 1KL4U, 1CM24U, 1CM25U, 1KL41U, 1KL42U, 1KL43U, 17L12U, 17M13U, 4CR24U, 4CR27U, 4CS28U, 4CS29U, 4KR44U, 4KR45U (Ch. C), CM, CR, CS)
	4"	PM	3-4Ω	SK4342 ⑥	4A07	22381	⑥ Used in model 4CS29U, 4KR45U (Ch. CM, CR, CS)

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MULLER PART No.	NOTES
L1	Fil. Choke	0Ω		CL2427	19-1001		4604	1. 4 Microhenries
L2	1st Video IF	0Ω	2Ω	CL3833-1			4604	Includes 41.25Mc trap.
L3	Fil. Choke	0Ω		CL2427	19-1001		4604	1. 4 Microhenries
L4	2nd Video IF	1Ω	1Ω	CL4SU	17-4522	TV-150	6219	
L5	Fil. Choke	0Ω		CL2427	19-1001		4604	1. 4 Microhenries
L6	3rd Video IF	1Ω	1Ω	CL4SU	17-4523	TV-130	6219	
L7	4th Video IF	1Ω	1Ω	CL4SU	17-4524	TV-130	6219	
L8	Series Peaking Coil			CK4225	19-1001		4604	1. 7 Microhenries
L9	Series Peaking Coil	8 7Ω		CL1356	19-3180*	TV-184*	6160*	180 Microhenries; Wound on 12K resistor
L10	Shunt Peaking Coil	8. 7Ω		CL1537	19-4180	TV-183	6179	180 Microhenries; Wound on 39K resistor
L11A	4 SMC Trap	3Ω		TR3365-1				
B	Sound IF Series	3Ω						
L12	Peaking Coil	7Ω		CL3398	19-3250*	TV-185*	6185*	250 Microhenries; Wound on 15K resistor
L13	Shunt Peaking Coil	1L 5Ω		CL3493	19-3300*	TV-190*	6155*	300 Microhenries; Wound on 56 Meg resistor.
L14	RF Choke	8Ω		CL3401	19-3075*	TV-181*	6172*	8. 5 Microhenries; Wound on 22K resistor.
L15	Quadrature Coil	8. 2Ω		CL3603-1			1481	

* Parallel with 12K resistor.
■ Parallel with 15K resistor.
▲ Parallel with 1Meg resistor.
◆ Parallel with 33K resistor

OLYMPIC MODELS 1CL22U, 1CL23U, 1CM24U, 1CM25U, 1KL41U, 1KL42U, 1KL43U, 17L12U, 17M13U, 4CR24U, 4CR27U, 4CS28U, 4CS29U, 4KR44U, 4KR45U (Ch. C), CM, CR, CS)

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L16	22Ω	53Ω	TR2294	20-1402*	TV-162*	6183*	205R1*	H-100*	HS-3*	Waveform winding = 34Ω

* Reverse coil mounting in can.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA
K1	Vertical Integrator Network	22K, 8200Ω, 8200Ω, 2000MMF, 5000MMF, 5000MMF	PC2435	Aerovox PA-110 Centralab PC-100 Cornell-Dubilier 115TM1 Erie 1405-01 Sprague V-1

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			OLYMPIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	C	3/8A 250V	FU4345	FH4344	332.375 (C - 3/8A)	346002	C 3/8	HC 3/10 to ½

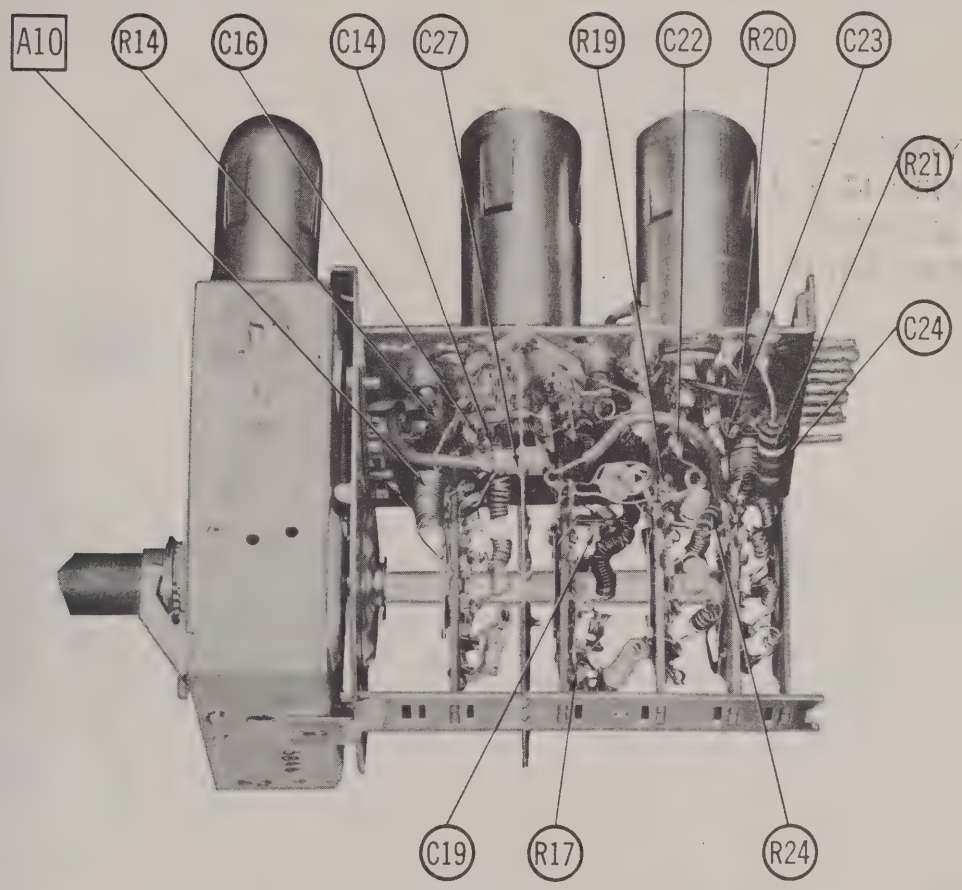
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		OLYMPIC PART No.	SYLVANIA PART No.	
M2	ST-47		1N82 or 1N82A	UHF Mixer (Clip in)
M3	1N64*	1N64	1N60	Video Det. (Pigtail)

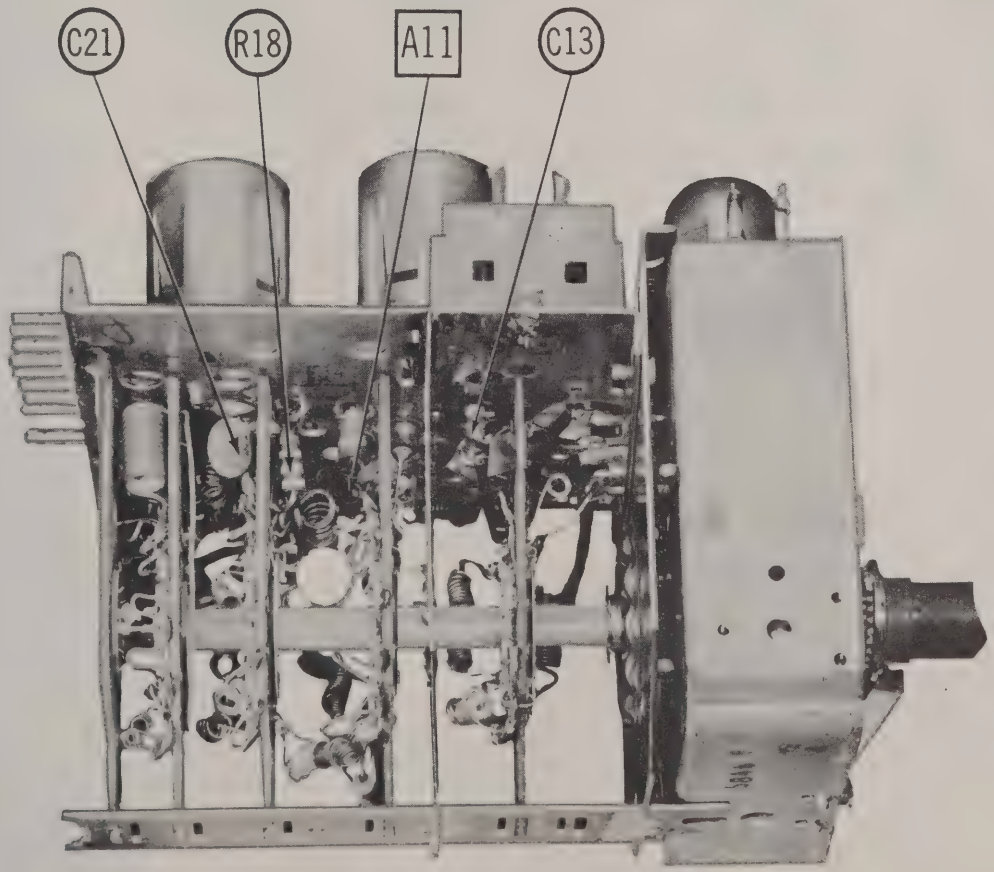
* Some versions may use crystal diode type 1N60 in this application.

MISCELLANEOUS

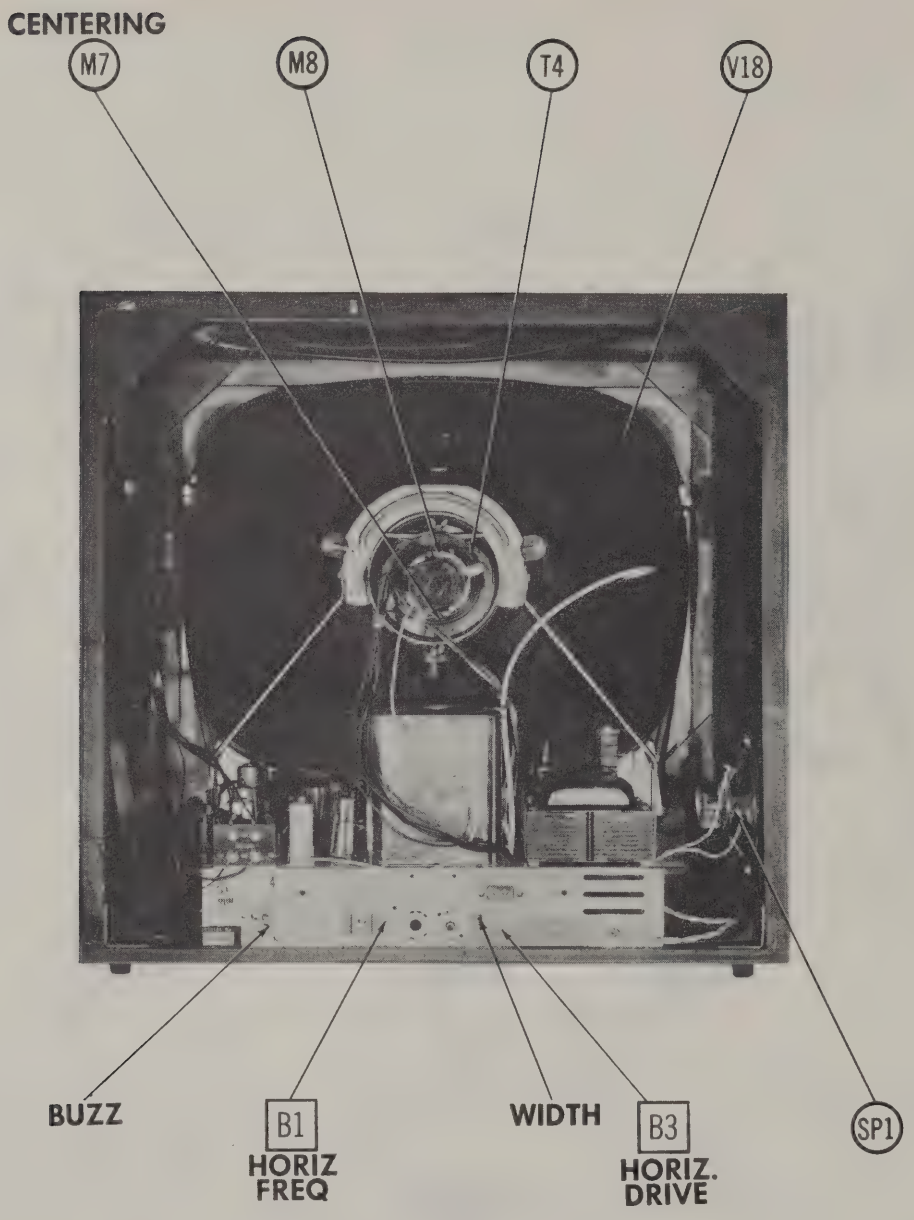
ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M4	Dial Light	BU187	#47
M5	Tuner	CL4416	VHF-UHF Combination.
M6	Focus Magnet	PP4418	Includes Centering Device. Chassis CR & CS only.
M7	Centering Device	PP2763	Chassis CL & CM
M8	Ion Trap	PP2248	
B3	Trimmer Cap.	CT3526	Horiz. Drive (110-580MMF)
	Cabinet	CA4154	Model 1KL42U
	Cabinet	CA4158	Model 4KR44U
	Cabinet	CA4165	Model 1KL41U
	Cabinet	CA4170	Model 4KR45U
	Cabinet	CA4185	Model 1KL43U
	Cabinet	CA4312	Model 4CR27U
	Cabinet	CA4313	Model 1TM13U
	Cabinet	CA4314	Model 1CM24U
	Cabinet	CA4315	Model 1CM25U
	Cabinet	CA4316	Model 1TL12U
	Cabinet	CA4317	Model 1CL23U
	Cabinet	CA4317-1	Model 1CL22U
	Cabinet	CA4321	Model 4CS28U
	Cabinet	CA4330	Model 4CS29U
	Cabinet	CA4364	Model 4CR26U
	Knob	KN4024	On-Off-Volume, Chassis CL & CR
	Knob	KN4404-1	On-Off-Volume, Chassis CM & CS
	Knob	KN4025	Contrast- Chassis CL & CR
	Knob	KN4405-1	Contrast-Chassis CM & CS
	Knob	KN4026	Channel Selector, Chassis CL & CR
	Knob	KN4519	Channel Selector, Chassis CM & CS
	Knob	KN4027	Fine Tuning
	Knob	KN4028	Vernier
	Knob	KN4052	Control (3 used) - Chassis CL & CR
	Knob	KN4052-2	Control (3 used) - Chassis CM & CS
	Knob	KN4409-1	Range
	Mask	PP3938	Chassis CR & CS
	Safety Glass	PP3939-1	Chassis CR & CS
	Safety Glass	PP3656-1	Chassis CL & CM



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Connect a short jumper across terminals "C" and "D" of the horizontal oscillator transformer (L16).

Set the horizontal hold control fully clockwise. Adjust the horizontal frequency slug (B1) until the picture falls in sync. Remove the jumper from L16. Connect the high side of the vertical amplifier of scope thru 5MMF to terminal "C" of L16. Low side to chassis. Adjust the horizontal waveform slug (B2) for a waveform similar to Fig. 7 with the broad and narrow peaks of equal amplitude. If necessary, during adjustment of B2 keep the picture in sync with horizontal hold control or B1. Remove the scope and retouch B1 for the following conditions.

1. At full clockwise position of the horizontal hold control, a blanking bar or picture jitter should be evident.
2. At full counter clockwise position of the horizontal hold control, the picture should lose sync with 4½ to 5 diagonal bars sloping downward to the left. If the picture remains in sync at either extreme setting of the horizontal hold control, switch off channel and back again so that the picture falls out of sync.

Adjust the horizontal drive trimmer (B3) counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture. If neither of these indications appear, adjust B3 for a picture slightly wider than necessary to fill the picture mask horizontally.

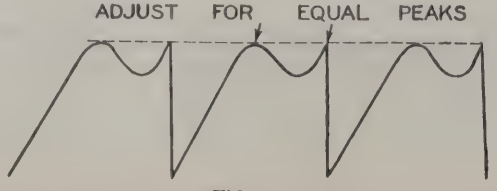
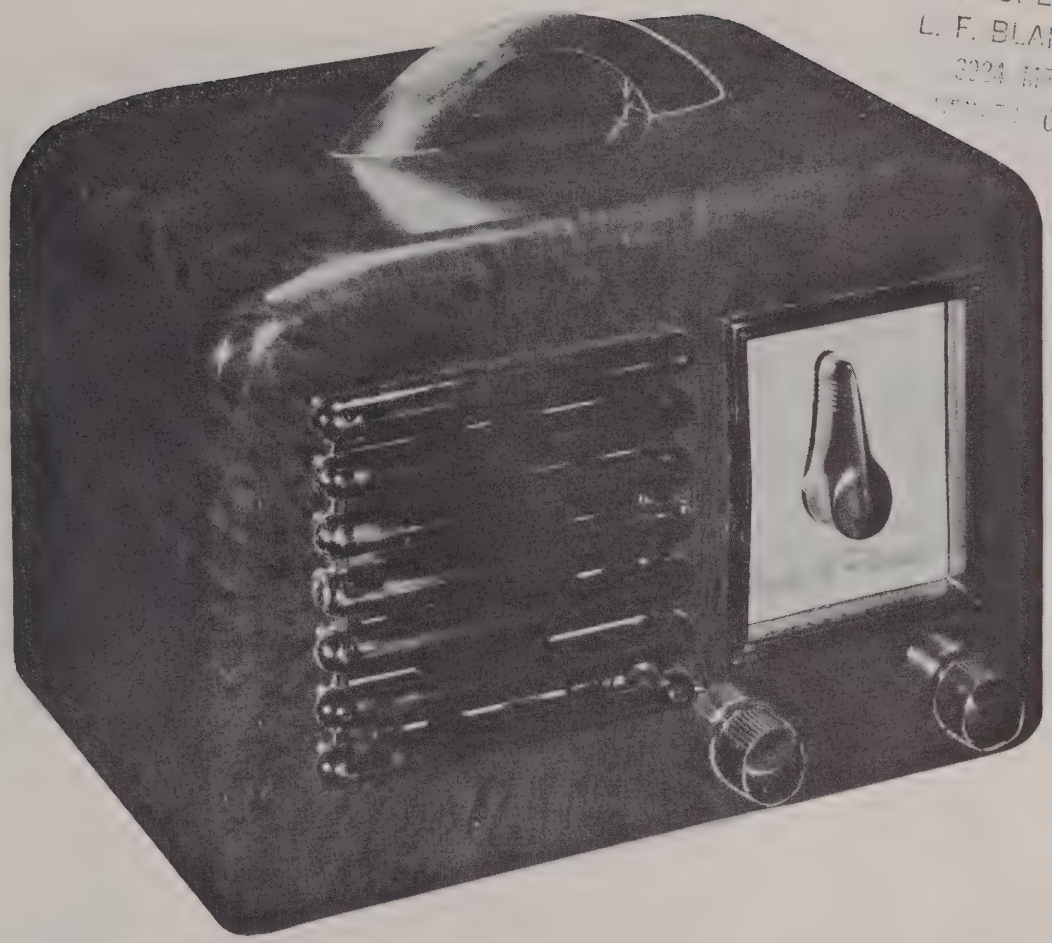


FIG. 7

PORT-A-PHONE
MODEL W1-100-UL

PROPERTY OF
L. F. BLANKENSHIP
3224 MEADE ST.
COLORADO

PORT-A-PHONE
MODEL W1-100-UL



PORT-A-PHONE
MODEL W1-100-UL

TRADE NAME	Port-A-Phone Model W1-100-UL
MANUFACTURER	Spiegel Inc., 1061 W. 35th St., Chicago 9, Ill.
TYPE SET	AC-DC Operated Wireless Intercommunication Unit
TUBES (Four)	Types 50C5 Osc.-Det. 12AV6 1st AF Amplifier, 12AU6 2nd AF Amplifier, 50C5 Output
POWER SUPPLY	110-120 Volts AC-DC RATING .23 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

PORT-A-PHONE
MODEL W1-100-UL

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Osc. -Detector	50C5	
V2	1st AF Amplifier	12AV6	
V3	2nd AF Amplifier	12AU6	
V4	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Port-A-Phone PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■40	150		AFH3-13	CO120	FP216	TMT-13	T-055	R2304*
B	▲80	150				TC41			
C	8	150							
C2	8	50		PRS50V10	BR105	TC32	TD-10-50	FM-0510	TVA-1304

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Port-A-Phone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C4	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C5	120			NP0-S1120	TCZ-120	TZ32	NP0-333-121		5TCC-T12	
C6	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C7	220			DI-00022	DD-221	G051	GP2K-221	UC-5322	5GA-T22	
C8	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C9	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C10	220			DI-00022	DD-221	G051	GP2K-221	UC-5322	5GA-T22	
C11	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C12	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C13	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C14	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C15	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C16	.022	400		BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C17	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C18	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Port-A-Phone PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	C25-3501	B-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
R2A	300K	½	C25-2400	AB-59	A47-300K-S	Q11-131	TA254L	Squelch
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R2A

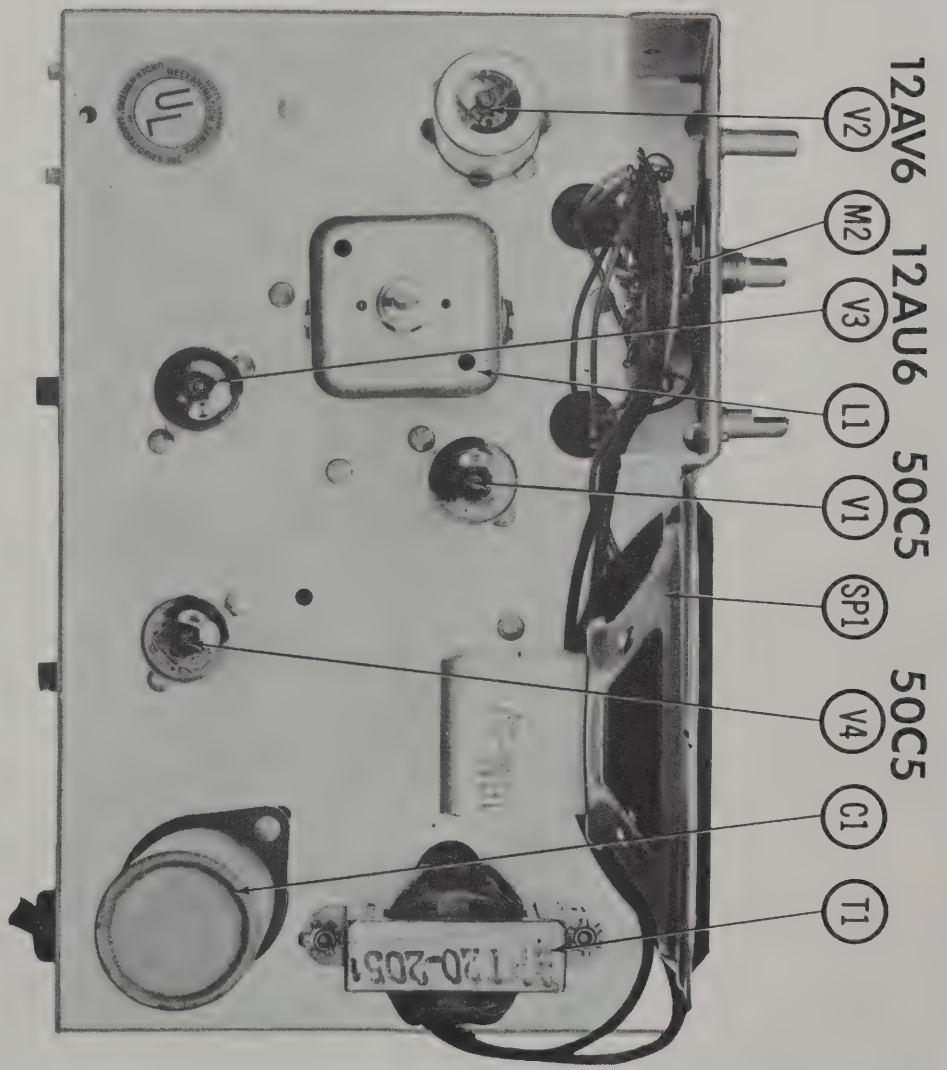
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Port-A-Phone PART No.	IRC PART No.	
R3	100K			BTS-100K	
R4	100K			BTS-100K	
R5	4. 7Meg			BTS-4. 7Meg	
R6	1Meg			BTS-1Meg	
R7	100K			BTS-100K	
R8	68K			BTS-68K	
R9	10K			BTS-10K	
R10	1Meg			BTS-1Meg	
R11	270K			BTS-270K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Port-A-Phone PART No.	IRC PART No.	
R12	1Meg			BTS-1Meg	
R13	10K			BTS-10K	
R14	470K			BTS-470K	
R15	4. 7Meg			BTS-4. 7Meg	
R16	150Ω	1		BTA-150	
R17	2200Ω			BTS-2200	
R18	330Ω	1		BTA-330	
R19	22Ω	2		BW2-22	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Port-A-Phone PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2650Ω	13Ω	BPT20-2051	Z1001		A-3856①			① Use appropriate taps.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Port-A-Phone PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	13Ω		4A1Z13		

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Port-A-Phone PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Osc. Coil	.3Ω	44Ω					Tertiary winding = 44Ω

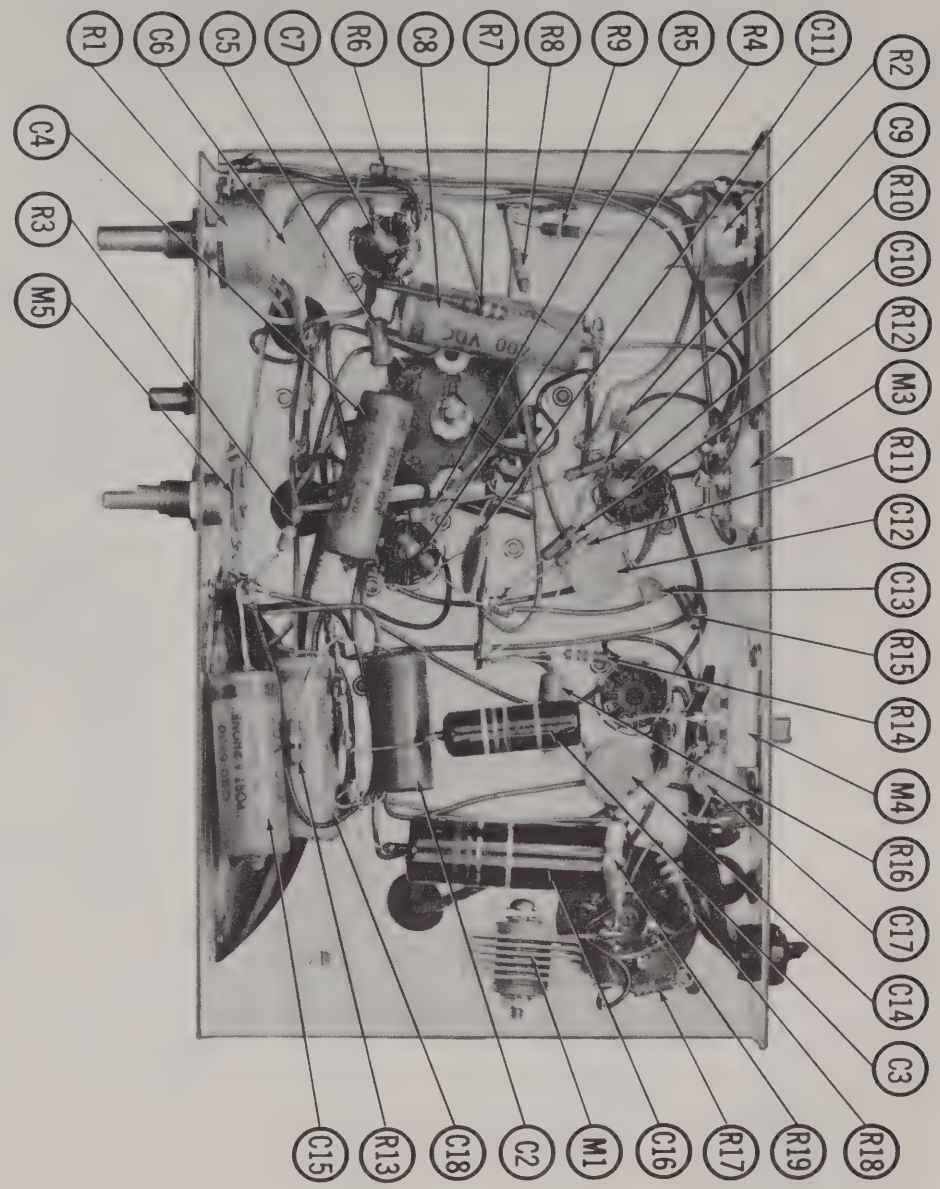
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Port-A-Phone PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.042A		1386	RS0650	6S65	8J1	65	

MISCELLANEOUS

ITEM No.	PART NAME	Port-A-Phone PART No.	NOTES
M2	Switch		Constant Transmit-Listen-Talk (Rotary, Wafer Type)
M3	Switch		AF Amp. Bypass (DPDT-Slide Type)
M4	Switch		SPDT-Slide Type
M5	Switch		On-Off (Power) Rotary, Wafer Type.

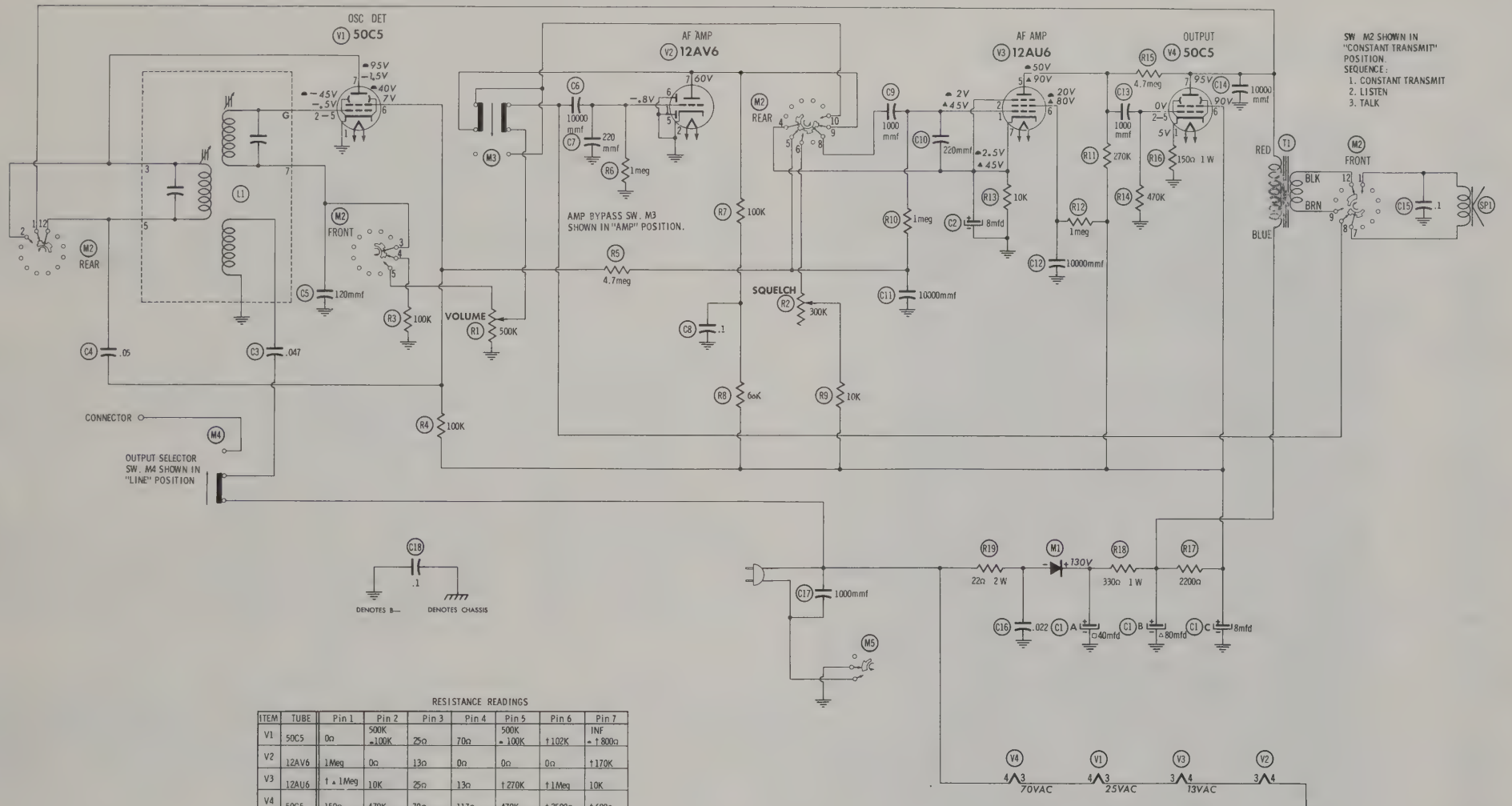
CHASSIS—BOTTOM VIEW



SET 341 FOLDER 12

PORT-A-PHONE
MODEL WI-100-UL

PORT-A-PHONE
MODEL WI-100-UL



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	50C5	0Ω	500K ▪100K	25Ω	70Ω	500K ▪ 100K	†102K	INF ▪ †800Ω
V2	12AV6	1Meg	0Ω	13Ω	0Ω	0Ω	0Ω	†170K
V3	12AU6	† ▲ 1Meg	10K	25Ω	13Ω	†270K	†1Meg	10K
V4	50C5	150Ω	470K	70Ω	117Ω	470K	†2500Ω	†600Ω

ALL VOLTAGES MEASURED IN "LISTEN" POSITION UNLESS OTHERWISE INDICATED.
† MEASURED FROM OUTPUT OF M1.
▪ MEASURED IN "TALK" POSITION.
▲ READING WILL VARY WITH SETTING OF SQUELCH CONTROL IN LISTEN POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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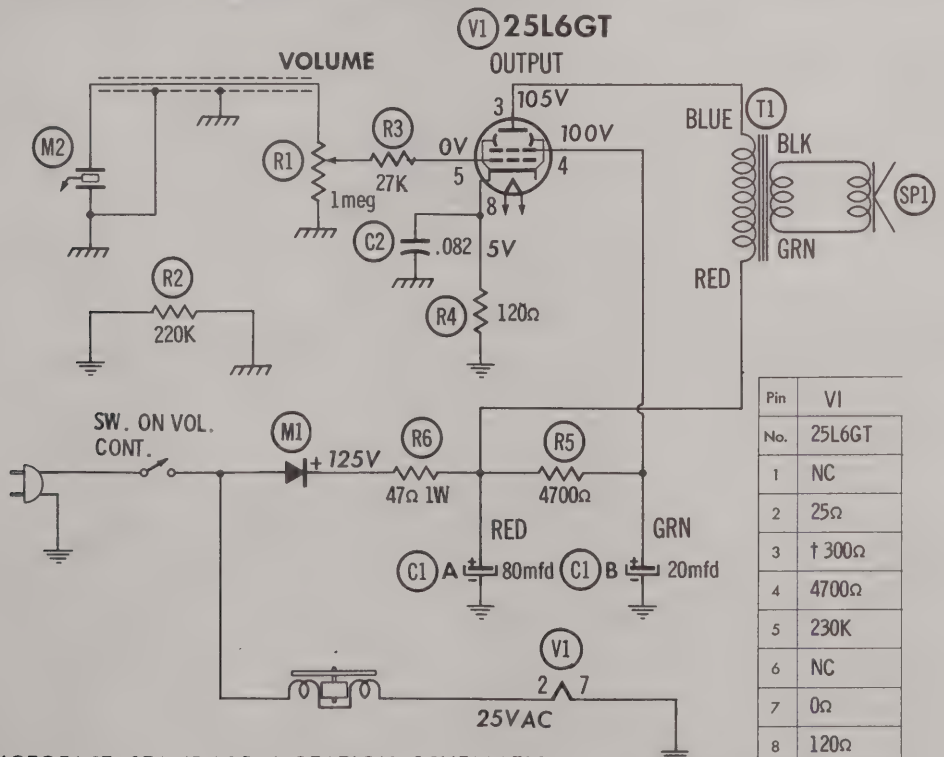
DENVER, COLORADO

RCA VICTOR MODELS 7-EY-1DJ, -1EF, -1JF (Ch. RS-155)

TRADE NAME	RCA Victor Models 7-EY-1DJ, -1EF, -1JF (Ch. RS-155)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N.J.
TYPE SET	AC Operated Phono Amplifier With 45RPM Automatic Record Changer
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .36 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - RCA VICTOR MODEL RP-190D-1 — SEE RCA RP-190 SERIES — PHOTOFACT SET 144-FOLDER 7 OR RECORD CHANGER MANUAL CM-4.



Pin No.	V1 25L6GT
1	NC
2	25Ω
3	† 300Ω
4	4700Ω
5	230K
6	NC
7	0Ω
8	120Ω

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† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	79823	PRS150V40	BBR†44215	TCT3116	TDLD-10	FMT-315	TVA-2460
B	20	150		4020					

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.082	400	75643							

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	101594	B-70	A47-1Meg-Z	Q13-137	U53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R2	220K		502422	BTS-220K	
R3	27K		502327	BTS-27K	
R4	120Ω			BTS-120	Note 1

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R5	4700Ω		502247	BTS-4700	
R6	47Ω	1	512047	BTA-47	

Note 1. Some versions may use 82Ω in this application. (Part #502082).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	77993	Z1101	A-3025	A-3332	26S58	S-12X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	79696	4A07	223S1	

SELENIUM RECTIFIER

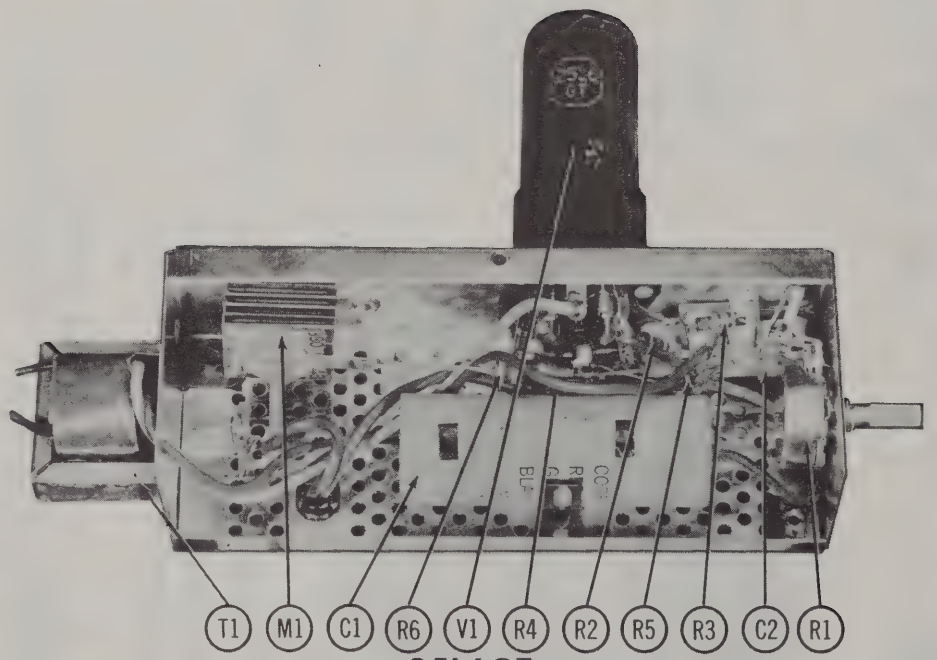
ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	RCA Victor PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.048A	77958	1003A	RS075	6S75	5M4	75	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	RCA Victor PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2		62-1	K	44	0-1 or S-1	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

CHASSIS—BOTTOM VIEW



25L6GT

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	RCA Victor PART No.	JENSEN PART No.	WALCO PART No.	
M3		* A-76LP or †A-67LP or ♦A-67LPD	*W-39MGA or †W-39MGS or ♦W-39MGD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
	Cabinet	Y2876	Model 7EY1DJ
	Cabinet	Y2877	Model 7EY1EF
	Cabinet	Y2875	Model 7EY1JF
	Knob	101596	Volume, Model 7EY1DJ
	Knob	101597	Volume, Model 7EY1EF
	Knob	101595	Volume, Model 7EY1JF
	Knob	101685	Control, Record Changer

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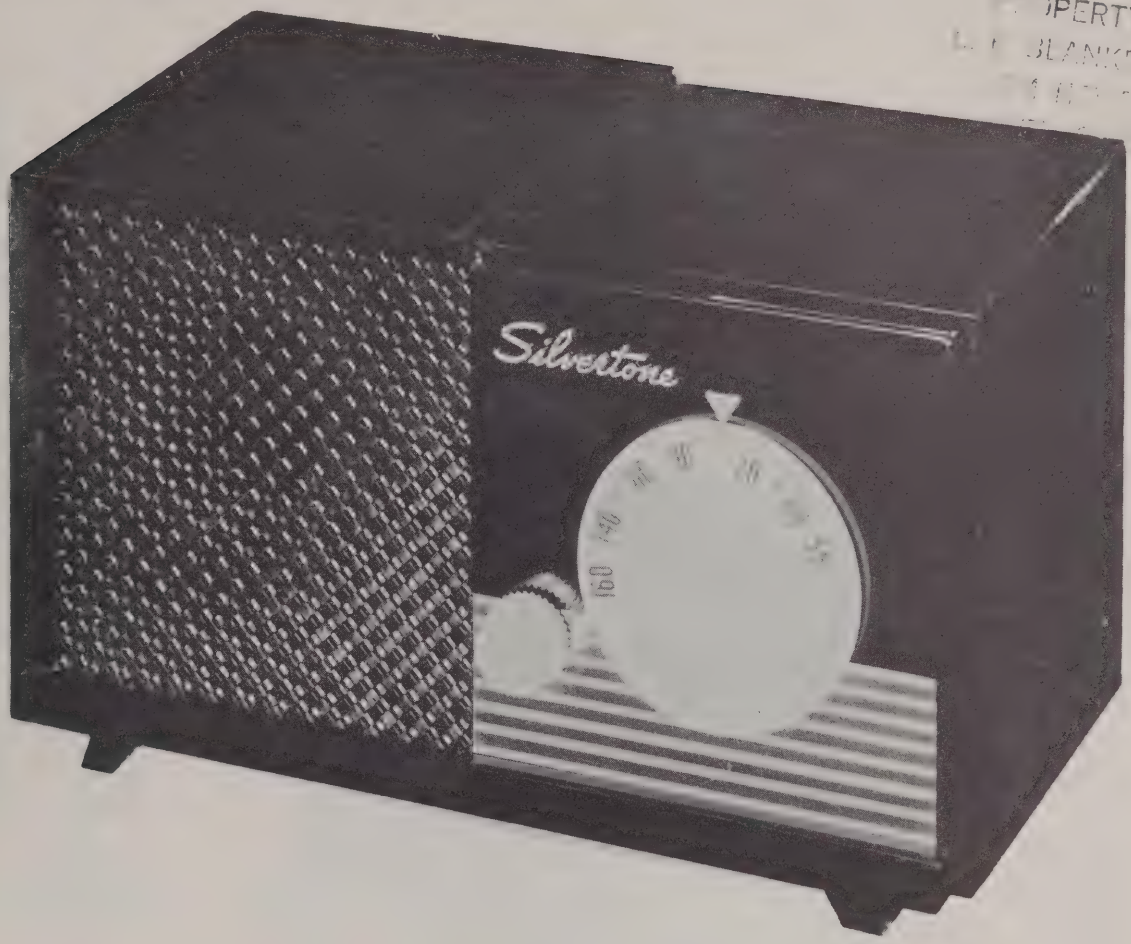
SILVERTONE MODEL
7003 (Ch. 132.41000)



SILVERTONE MODEL
7003 (Ch. 132.41000)

TRADE NAME	Silvertone Models 7003, 7004 (Ch. 132.41000)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AT6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC — RATING .27 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400\Mod	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"
4.		"	600KC	Tune to 600KC signal	"	A7	"

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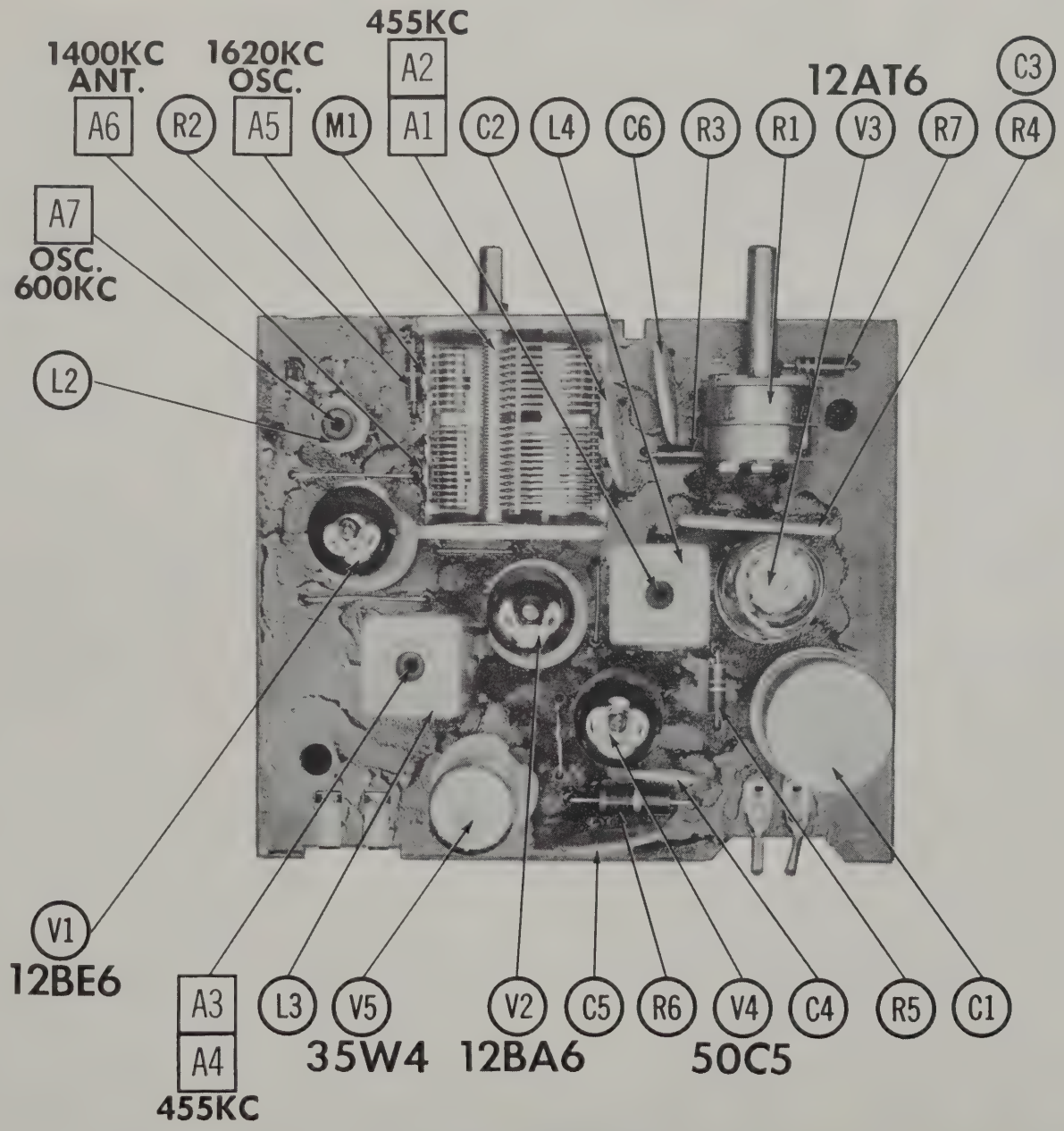


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det.-AVC-AF Amplifier	12AT6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	43672	AFH2-15	B0150	FP213	TMD-12	D-065	TVL-2432
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	20000		43674-2	BPD-02	DF-203	K085	817-02		5HK-S2	
C3A	220		†43743-1	†PA-458	†PCT-158				†DT-5	
B	2000									
C	5000									
D	250									
E										
C4	10000		43674-1	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C5	20000		43674-2	BPD-02	DD-203	K085	817-02		5HK-S2	
C6	20000		43674-2	BPD-02	DD-203	K085	817-02		5HK-S2	

† Items C3A, C3B, C3C, C3D, C3E, R4A, R4B, R4C are combined in one unit.
When replacing items separately, C3D and C3E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	C43671	B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	Not Req.	SWE-12	76-1	US-26	Attach to R1A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R2	22K		43687-223	BTS-22K	
R3	2.2Meg		43687-225	BTS-2.2Meg	
R4A	6.8Meg		†43743-1	BTS-6.8Meg	
B	470K			BTS-470K	
C	470K			BTS-470K	
R5	120Ω	1	43689-121	BTS-120	
R6	1200Ω		43688-122	BTA-1200	
R7	330K		43687-334	BTS-330K	

† Items R4A, R4B, R4C, C3A, C3B, C3C, C3D, C3E are combined in one unit.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	Part of Spkr. C43096	Z1101	A-3025	A-3332	26S58 ①	S-12X	① Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	C43096	4A07	22381	

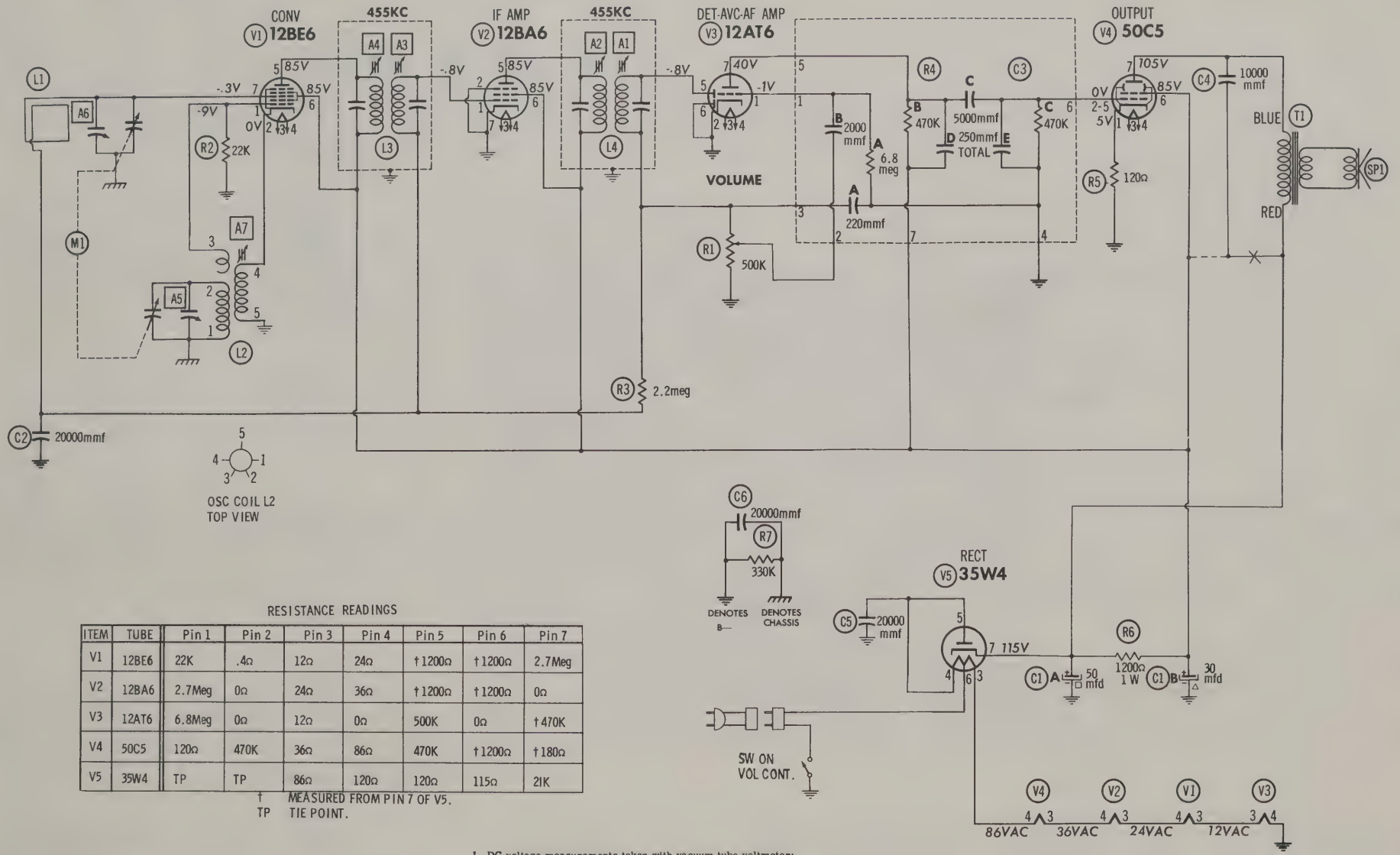
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.9Ω		43726-1				Includes cabinet back
L2	Osc.Coil	.4Ω	5.3Ω	43644-1				
L3	Input IF	16Ω	16Ω	43669-2				
L4	Output IF	16Ω	16Ω	43669-2				

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning Cap.	43987	2 Gang
	Cabinet	43723-1	Brown
	Cabinet	43723-2	Ivory
	Knob	43654-2	Tuning - Ivory
	Knob	43653-2	On-off-volume - Ivory

SILVERTONE MODEL 7003 (Ch. 132. 41000)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.4Ω	12Ω	24Ω	†1200Ω	†1200Ω	2.7Meg
V2	12BA6	2.7Meg	0Ω	24Ω	36Ω	†1200Ω	†1200Ω	0Ω
V3	12AT6	6.8Meg	0Ω	12Ω	0Ω	500K	0Ω	†470K
V4	50C5	120Ω	470K	36Ω	86Ω	470K	†1200Ω	†180Ω
V5	35W4	TP	TP	86Ω	120Ω	120Ω	115Ω	21K

† MEASURED FROM PIN 7 OF V5.
TP TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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SYLVANIA MODELS 21C401, 21C404, 21C405, 21C508, 21C509, 21T101, 21T102, 21T104, 21T105, 21T106, 21T110, 24T101, 21T207, 21T208, 24T101, 24T201 Series (Ch. 1-532-3, -4, -5, -6, -7)

SYLVANIA MODEL 21T102MU (Ch. 1-532-4)

TRADE NAME	Sylvania	MODELS	CHASSIS
		21C401, 21C404, 21C405, 21T101, 21T102, 21T104, 21T105, 21T106, 21T110, 24T101	1-532-3, -4
		21C508, 21C509, 21T207, 21T208, 24T201	1-532-5, -6, -7
MANUFACTURER	Sylvania Electric Products, Inc., Radio & Television Div., 254 Rano St., Buffalo, 7, N.Y.		
TYPE SET	Television Receiver		
TUBES	Nineteen		
POWER SUPPLY	110-120 Volts AC-60mCycle	RATING 1.58 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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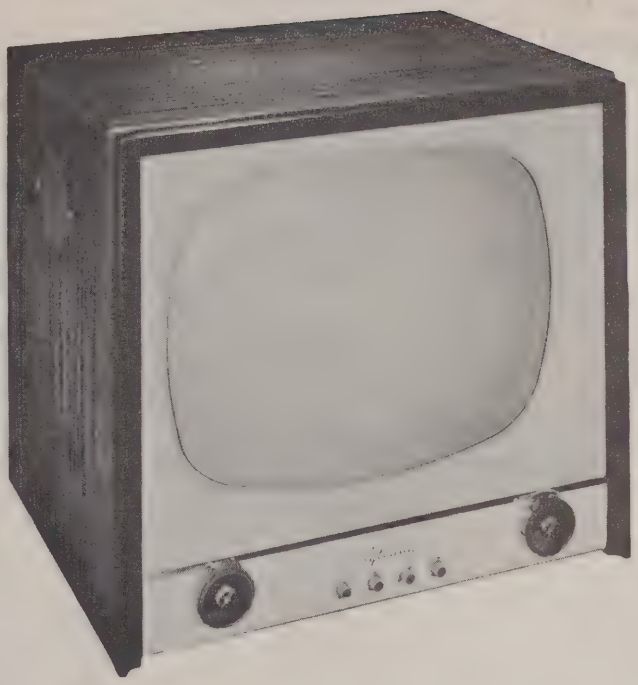
*TRADE MARK

SYLVANIA MODELS 21C401, 21C404, 21C405, 21C508, 21C509, 21T101, 21T102, 21T104, 21T105, 21T106, 21T110, 21T207, 21T208, 24T101, 24T201 Series (Ch. 1-532-3, -4, -5, -6, -7)



MODEL	CHASSIS
21T102MU	1-532-4

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove only the channel selector and fine tuning knobs from front panel of cabinet.

2. Remove 8 wood screws. Remove rear cover.

3. Disconnect speaker leads, HV lead, yoke plug and HaloLight plug.

4. Remove 2 wood screws holding interlock bracket, 1 wood screw holding VHF antenna terminal bracket and 2 wood screws holding UHF antenna terminal bracket.

5. Remove 3 chassis bolts. Remove chassis.

6. Remove 2 speaker nuts. Remove speaker.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 11.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to the set. Adjustment is located on top of the chassis. Set the horizontal hold control to the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L14) located on top of the chassis.

FUSES

Two fuses are used. One for horizontal sweep circuit protection and one for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of picture tube located flush against the yoke. Turn the tab and at the same time rotate the ring around the tube until picture is properly centered.

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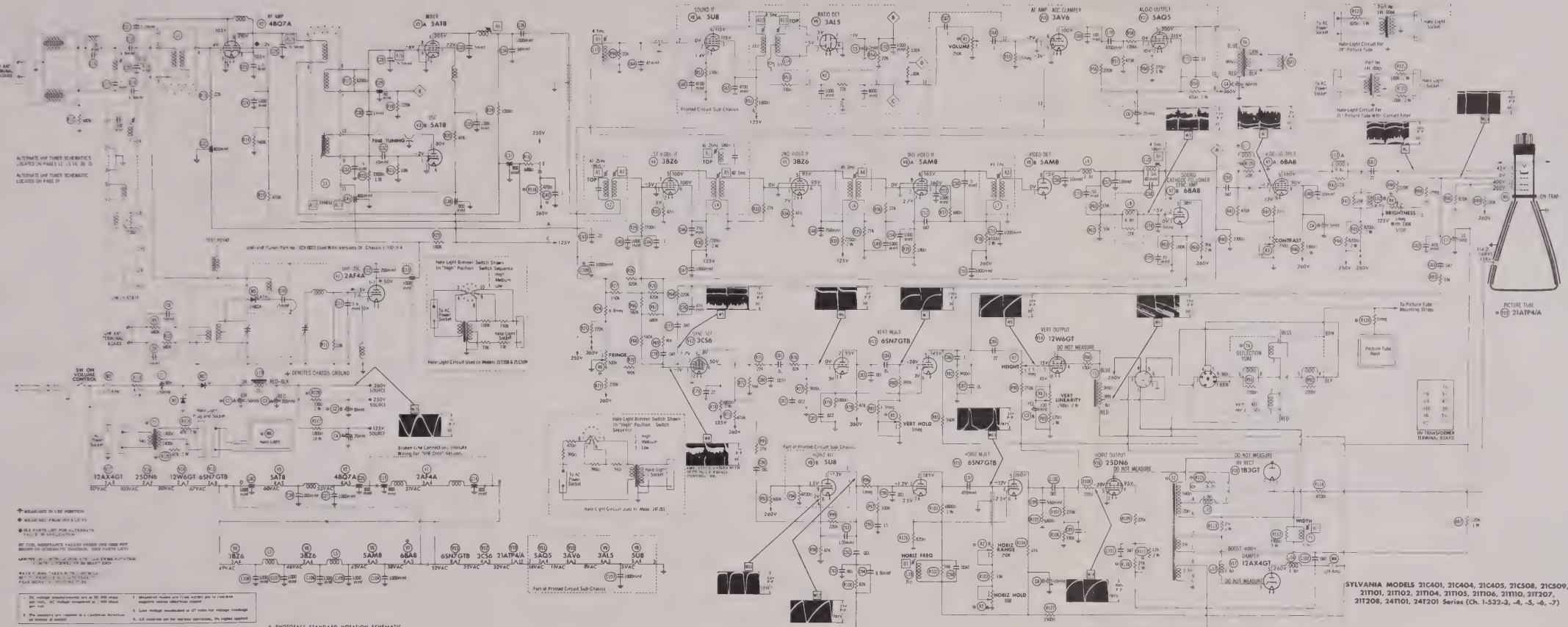
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A PHOTOFACT STANDARD NOTATION SCHEMATIC
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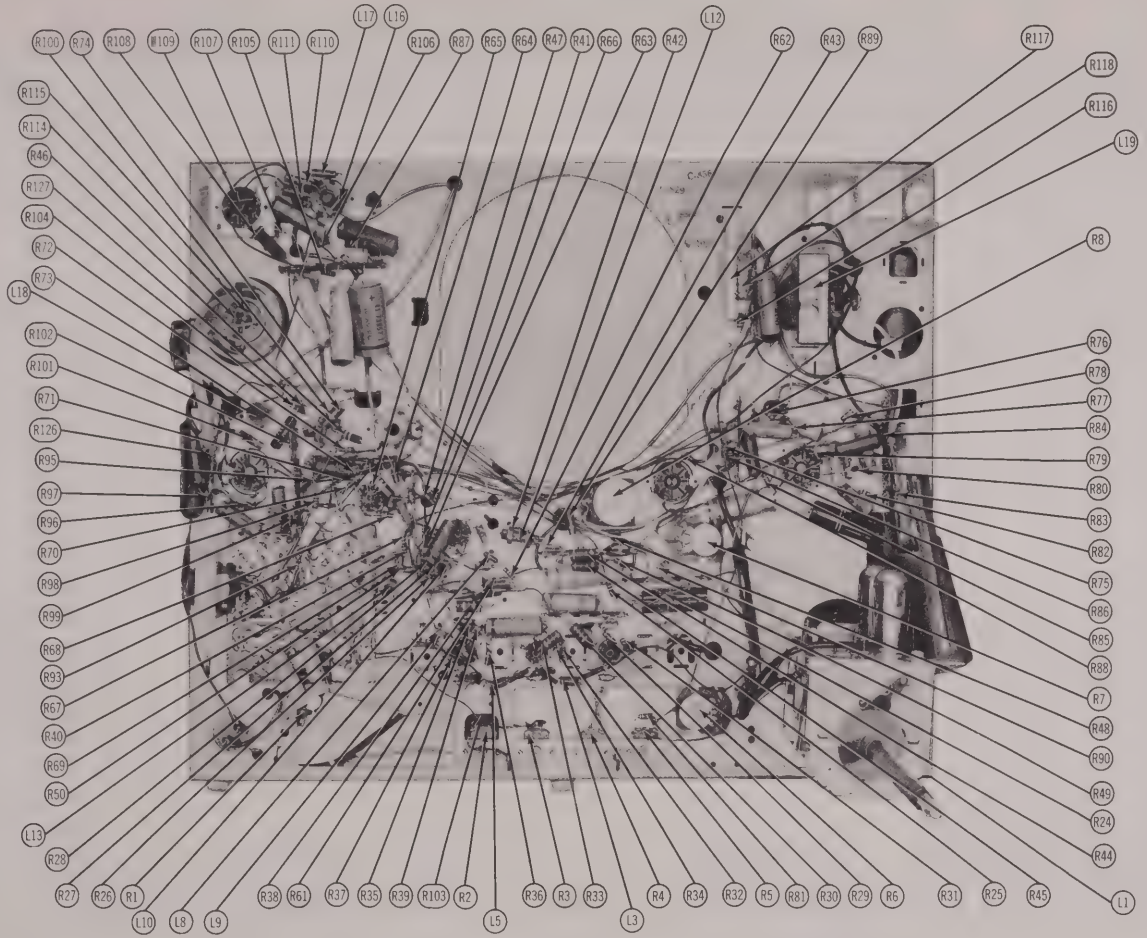
CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

SET 341 FOLDER 15



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

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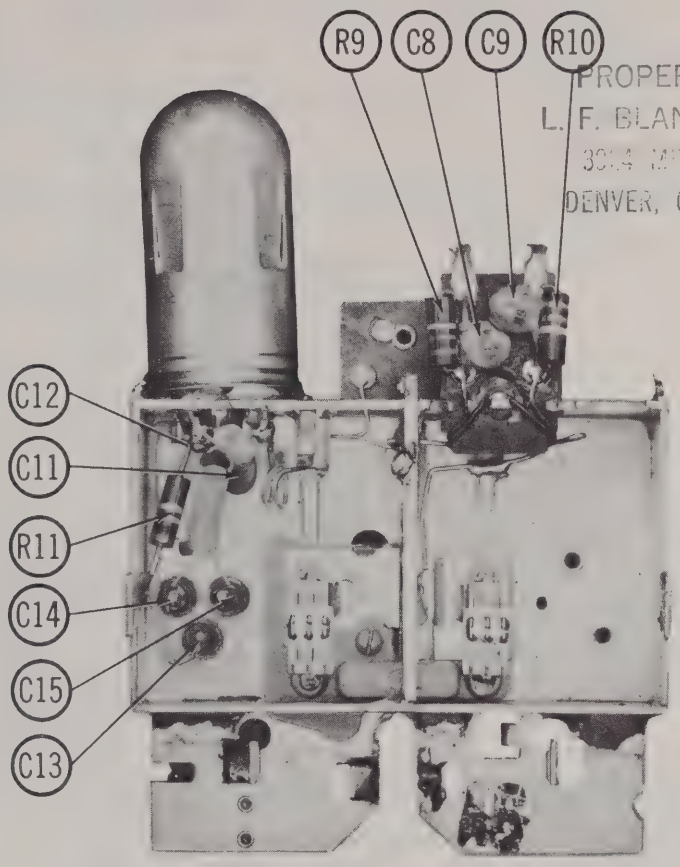
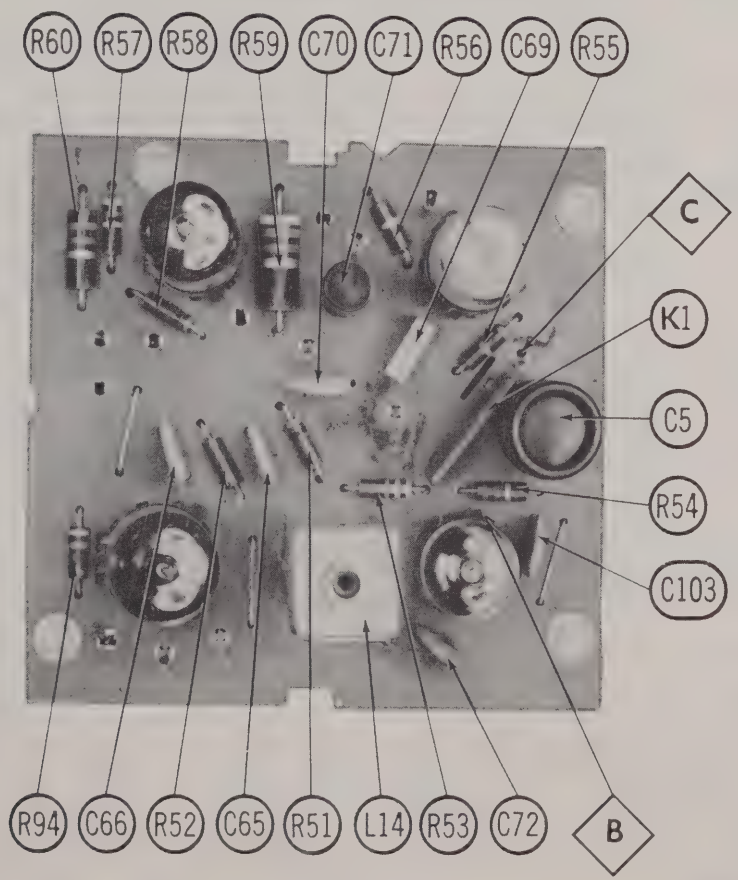


UHF TUNER FRONT VIEW



SOUND IF PRINTED CIRCUIT SUB-CHASSIS

SET 341 FOLDER 15

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped away from the chassis.
Allow a 15 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3.5 volt bias supply to the ungrounded side of C44. Connect the positive lead fo chassis. Use non-metallic alignment tools.
If the marker generator is a separate unit from the sweep generator, loosely couple marker generator to sweep generator output. Use low marker output.
Keep all leads from generators and scope shielded and as short as possible.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to chassis.	Not Used	47.25MC	Any non-interfering channel.	USE VTVM DC probe to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection. Use high signal generator output.
2.	"	"	"	41.25MC	"	"	A2	"
3.	"	"	"	43.7MC	"	"	A3	Attenuate generator output to maintain 1 to 2 volts on VTVM. Adjust for maximum deflection.
4.	"	"	"	45.0MC	"	"	A4	"
5.	"	"	"	42.5MC	"	"	A5	"
6.	.001MFD	High side to pin 1 (grid) of 3BZ6 (V4). Low side to chassis.	43.5MC (10MC Swp)	42.4MC 45.75MC	"	Vert. amp. thru 33K to point (A). Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A3 thru A5 to obtain desired response. A4 affects high frequency side to curve. A5 affects low frequency side. Adjust A3 for maximum amplitude and MINIMUM tilt. Repeat steps 1 and 2.
7.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to chassis.	"	41.25MC 42.6MC 45.75MC	"	"	A6, A7	Adjust A6 and A7 for response similar to Fig. 2. If necessary, retouch A3, A4 and A5 for correct tilt and position of 45.75MC and 42.6MC markers. Increase sweep generator and scope output to observe trap markers. If necessary, retouch A1 and A2 to place markers in trap notches as in Fig. 2. Remove bias and test equipment.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.
Short pin 1 of 3BZ6 (V5) to chassis with a short jumper wire or clip lead.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	47K Resistor	High side to ungrounded side to C57. Low side to chassis.	4.5MC (unmod)	Any non-interfering channel.	DC probe to point (B). Common to chassis.	A9, A10	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point (C). Common to point (D).	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	47K Resistor	High side to ungrounded side of C57. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel.	Vert. amp. to point (B). Low side to chassis.	A9, A10	Disconnect stabilizing capacitor C5. Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
9.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A11	Reconnect C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Ground pin 1 of 3BZ6 (V5) with a short clip lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001MFD	High side to pin 7 (grid) of 6BA8 (V7). Low side to chassis.	4.5MC (unmod)	Any	DC probe thru detector (Fig. 5) to pin 11 (cathode) of picture tube. Common to chassis.	A8	Short pin 1 (grid) of 3BZ6 (V5) to chassis. Adjust A8 for MINIMUM deflection. Remove short from V5.

ALTERNATE 4.5MC TRAP ALIGNMENT USING ON THE AIR SIGNAL

Turn set on and tune in a TV station. Misadjust fine tuning until sound bars can be seen in the picture. A fine grain-like background will be noted in the picture.
Adjust A8 until the grain-like background is eliminated or at a minimum.
Readjust the fine tuning for a normal picture.

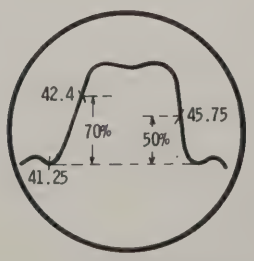


FIG. 1

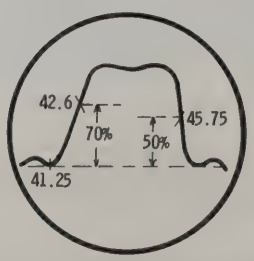


FIG. 2

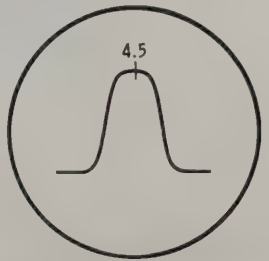


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR TUNERS #323-0071, 323-0072 AND 323-0081

Connect the bias as under "Video IF Alignment".
Remove 1/4 amp. fuse located next to high voltage cage to eliminate possible erroneous indications.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 47K to point Ⓐ. Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should fall at 50%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A13	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A14	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A15	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A16	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A17	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A18	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A19	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A20	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A21	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A22	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A23	

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VHF RF AND MIXER ALIGNMENT FOR TUNERS #323-0071, 323-0072 AND 323-0081

Connect the negative lead of a 2. 5 volt bias supply to the tuner AGC terminal. Connect the positive lead to chassis.
Remove 1/4 amp. fuse located next to high voltage cage to eliminate possible erroneous indications. All connecting leads should be as short as possible and shielded.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205. 25MC 209. 75MC	12	Vert. amp. thru 10K to point Ⓔ. Low side to chassis.	A24, A25, A26	Adjust for response curve similar to Fig. 7 with markers above 90%.
13.	"	"	213MC (10MC Swp)	211. 25MC 215. 75MC	13	"		Check for response similar to Fig. 7. If markers fall below 70% on any channel, make compromise adjustments of A24, A25 and A26 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			195MC (10MC Swp)	193. 25MC 197. 75MC	10			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp)	77. 25MC 81. 75MC	5			
			69MC (10MC Swp)	67. 25MC 71. 75MC	4			
			63MC (10MC Swp)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp)	55. 25MC 59. 75MC	2			

VHF OSCILLATOR ALIGNMENT FOR TUNERS #323-0074 AND 323-0075

Remove the tuner cover and set the fine tuning control to its mid-range position by setting the fine tuning capacitor plates at the half-meshed position.
Connect the bias as under "Video IF Alignment".
Remove the 1/4 amp. fuse located next to the high voltage cage to eliminate possible erroneous indications.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 33K to point Ⓐ. Low side to chassis.	A27	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should fall at 50%.
15.	"	"	85MC (10MC Swp)	83. 25MC 87. 75MC	6	"	A28	"
16.	"	"	69MC (10MC Swp)	67. 25MC 71. 75MC	4	"	A29	"
17.	"	"	57MC (10MC Swp)	55. 25MC 59. 75MC	2	"	A30	"

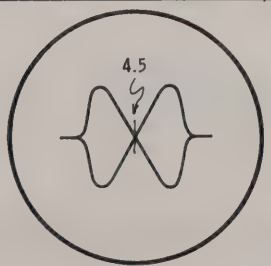


FIG. 4

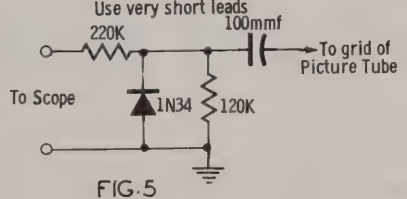


FIG. 5

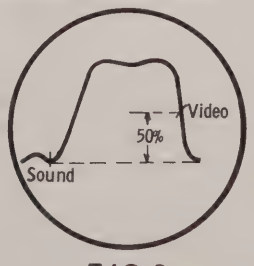


FIG. 6

SYLVANIA MODELS 21C401, 21C404, 21C405, 21C508, 21C509, 21T101, 21T102, 21T104, 21T105, 21T106, 21T110, 21T207, 21T208, 24T101, 24T201 Series (Ch. 1-532-3, -4, -5, -6, -7)

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT FOR TUNERS #S-323-0074, S-323-0075 AND S-323-0079

Connect the bias as under "Video IF Alignment".
Remove IF input cable from VHF tuner socket.
Remove VHF tuner cover to gain access to internal coils and adjustments.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	Two 120Ω carbon resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru .01MFD to point (E). Low side to chassis.	A31, A32, A33	Adjust A31 for maximum amplitude. Adjust A32 for a flat-topped response. Adjust A33 for proper position of markers. See Fig. 8. Picture carrier should be at 100%. Sound carrier may be as low as 70%.
19.	"	"	177MC (10MC Swp)	175. 25MC 179. 75MC	7	"	A34, A35	Adjust for symmetrical response as in Fig. 8
20.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12			Check each channel for response similar to Fig. 8. If not within limits, repeat steps 18 and 19. If necessary, make compromise adjustments of A31 thru A35 for best acceptable response.
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			195MC (10MC Swp)	193. 25MC 197. 75MC	10			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
21.	"	"	85MC (10MC Swp)	83. 25MC 87. 75MC	6	"	A36, A37, A38	Adjust A36 for maximum mid-band height. Adjust A37 for flat-topped response. Adjust A38 for proper marker position as in Fig. 8.
22.	"	"	79MC (10MC Swp)	77. 25MC 81. 75MC	5	"	A39, A40, A41	Compress or expand coil turns for curve similar to Fig. 8.
23.	"	"	69MC (10MC Swp)	67. 25MC 71. 75MC	4	"	A42, A43, A44	"
24.	"	"	63MC (10MC Swp)	61. 25MC 65. 75MC	3	"	A45, A46 A47	"
25.	"	"	57MC (10MC Swp)	55. 25MC 59. 75MC	2	"	A48, A49, A50	"
26.	Recheck all channels for flat-topped response. If necessary, retouch A31 thru A50 in order given. A dip of 30% is permissable on all channels. Remove test equipment.							

VHF OSCILLATOR ALIGNMENT FOR TUNER #S-323-0079

Remove the tuner cover and set the fine tuning control to its mid-range position by setting the fine tuning capacitor plates at half-meshed position.
Connect the bias as under "Video IF Alignment".
Remove the 1/4 amp. fuse located next to the high voltage cage to eliminate possible erroneous indications.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
27.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 33K to point (A). Low side to chassis.	A51	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should fall at 50%.
28.	"	"	201MC (10MC Swp)	199. 25MC 203. 75MC	11	"	A52	"
29.	"	"	183MC (10MC Swp)	181. 25MC 185. 75MC	8	"	A53	"
30.	"	"	85MC (10MC Swp)	83. 25MC 87. 75MC	6	"	A54	"
31.	"	"	69MC (10MC Swp)	67. 25MC 71. 75MC	4	"	A55	"

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

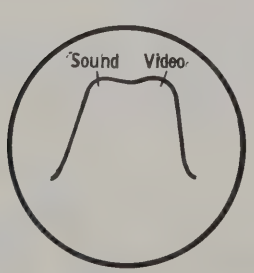


FIG. 7

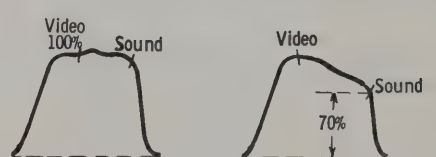
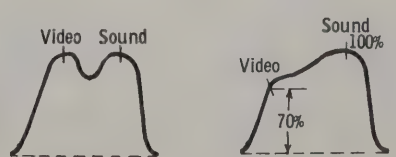
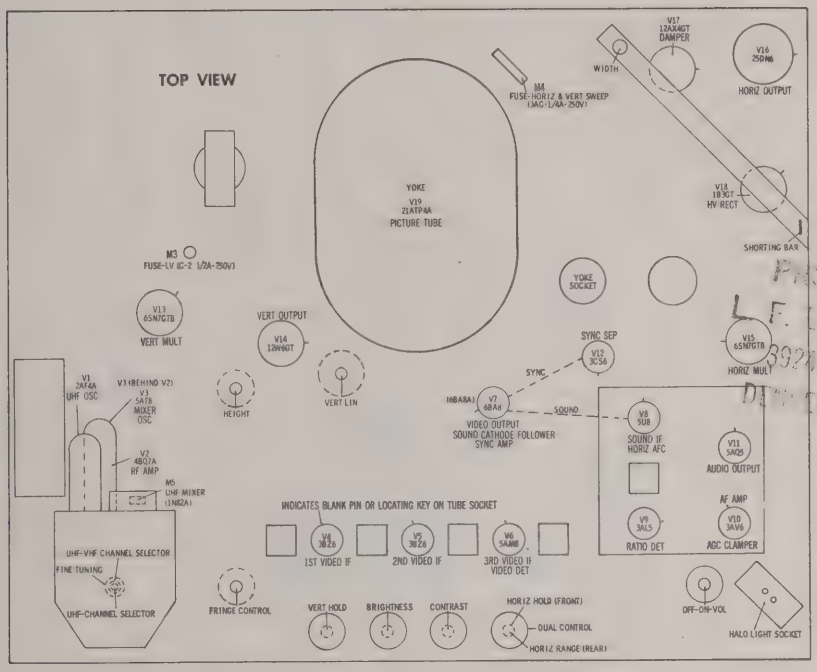


FIG. 8



TUBE PLACEMENT CHART



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DENVER, COLORADO

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

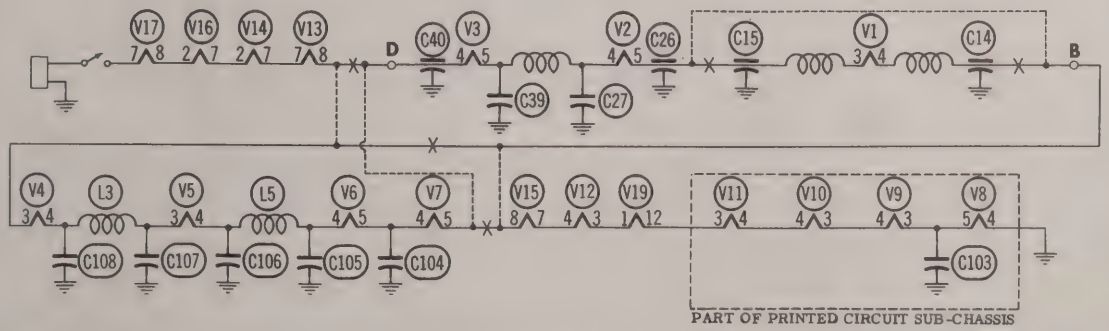
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V7, V19**
Has pic, no sound - **V8, V9, V10, V11**
Overloaded picture - **V10**

SYNC FAILURE
No vert. sync - **V12, V13**
No horiz. sync - **V8, V12, V15**
No vert. or horiz. sync - **V7, V12**

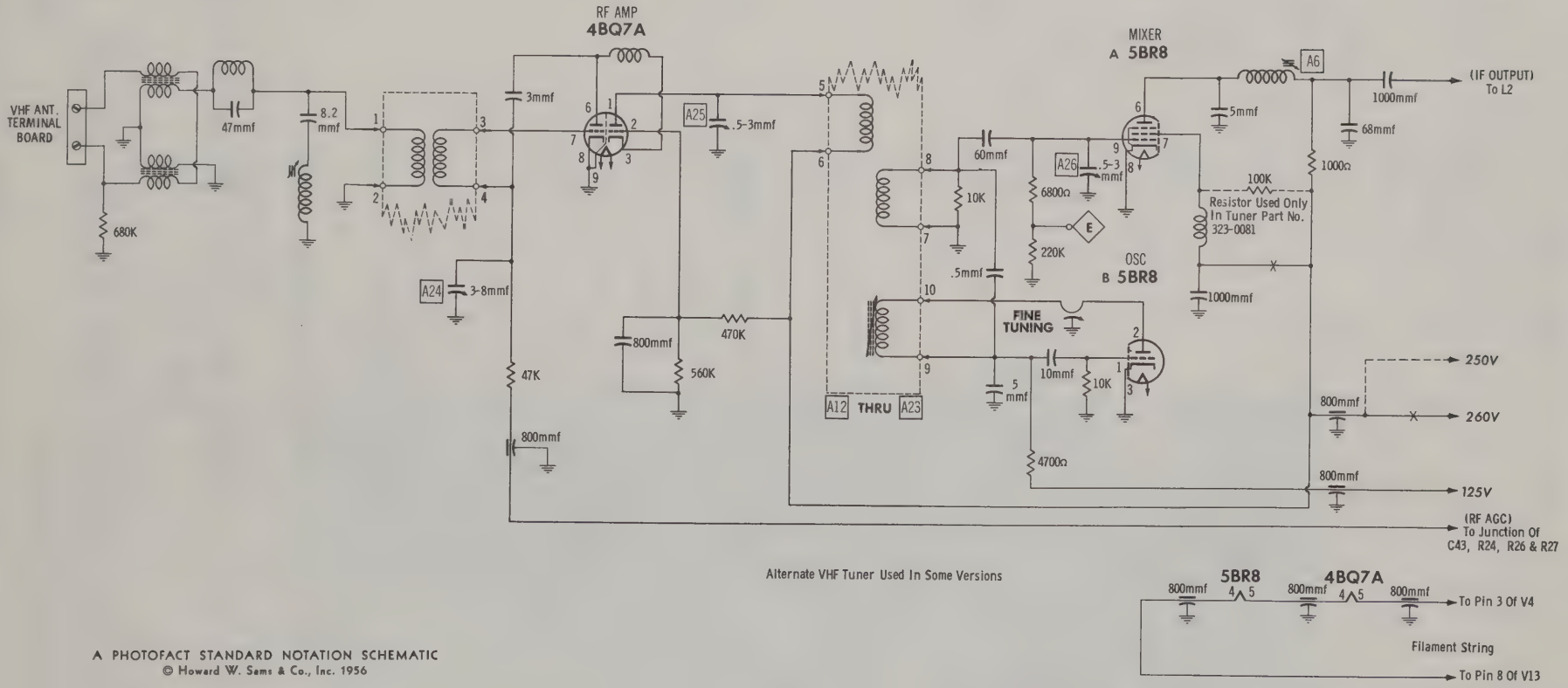
SWEEP FAILURE
No raster, has sound - **V15, V16, V17, V18, V19, Fuse (M4)**
No vertical deflection - **V13, V14**
Poor vert. linearity or foldover - **V13, V14**
Poor horiz. linearity or foldover - **V15, V16, V17**
Narrow picture - **V15, V16, V17, V18, M1, M2**
Vert. off freq. - **V12, V13**
Horiz. off freq. - **V8, V12, V15**

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative (See circuit below).



SET 341 FOLDER 15

SYLVANIA MODELS 21C401, 21C404, 21C405, 21C508, 21C509, 21T101, 21T102, 21T104, 21T105, 21T106, 21T110, 21T207, 21T208, 24T101, 24T201 Series (Ch. 1-532-3, -4, -5, -6, -7)



Alternate VHF Tuner Used In Some Versions

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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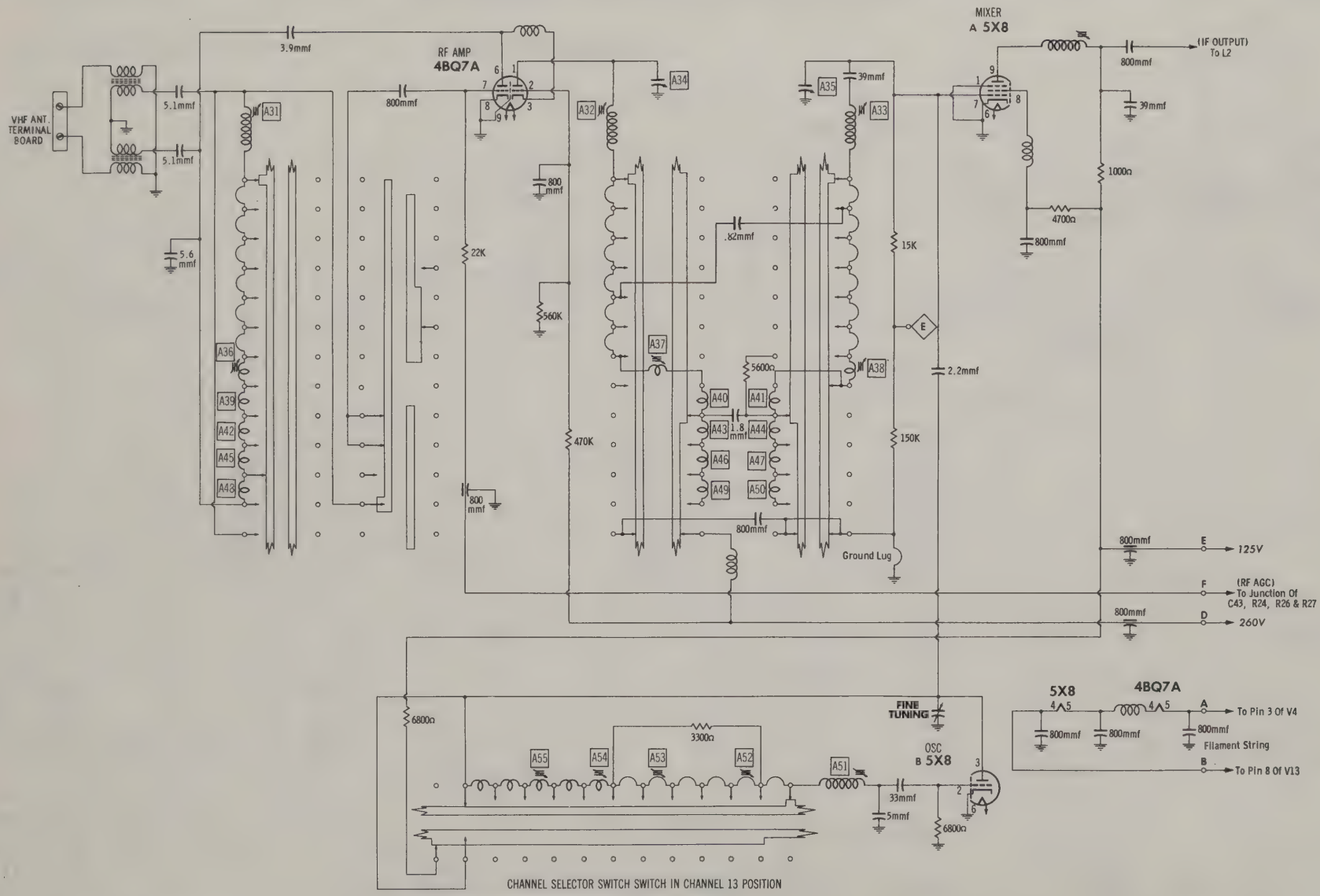
ALTERNATE VHF TUNER SCHEMATIC

SYLVANIA MODELS 21C401, 21C404, 21C405, 21C508, 21C509, 21T101, 21T102, 21T104, 21T105, 21T106, 21T110, 21T207, 21T208, 24T101, 24T201 Series (Ch. 1-532-3, -4, -5, -6, -7)

ALTERNATE VHF TUNER SCHEMATIC



VHF Tuner Part No. 323-0079 Used With Versions of Chassis 1-532-3, -4.

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ALTERNATE VHF TUNER SCHEMATIC

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Oscillator	2AF4A	
V2	RF Amplifier	4BQ7A	
V3	Mixer-Oscillator	5AT8	
V4	1st. Video IF Amplifier	3BZ6	
V5	2nd. Video IF Amplifier	3BZ6	
V6	3rd. Video IF Amplifier-Video Detector	5AM8	
V7	Video Output- Sound Cathode Follower-Sync Amplifier	6BA8	Note 1
V8	Sound IF Amplifier-Horiz. AFC	5U8	
V9	Ratio Detector	3AL5	
V10	AF Amplifier-AGC Clamper	3AV6	
V11	Audio Output	5AQ5	
V12	Sync Separator	3CS6	
V13	Vert. Mult.	6SN7GTB	
V14	Vert. Output	12W6GT	
V15	Horiz. Mult.	6SN7GTB	
V16	Horiz. Output	25DN6	
V17	Damper	12AX4GT	
V18	HV Rectifier	1B3GT	

Note 1. Some models use 6BA8A.

PROPERTY OF
L. F. BLANKENSHIP
3224 MEADE ST.
DENVER, COLORADO

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	SYLVANIA PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V19	21ATP4/ ② 21ATP4A 24YP4 ②	21ATP4 ① 24YP4 ①	21ATP4 ① 24YP4 ①	21ATP4/ 21ATP4A ② 24YP4 ②	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	150	200	161-1025	PR1-100	EZ10400	WS427	TD-150-300	S-160	TVA-1575
C2A	150	300	161-2018 (Note 1)	PR1-100 *	EZ10400 *	WS427 *	TD-150-300 *	S-200 *	TVA-1575 *
B	30	300	(Note 1)						
C3A	200	300	161-2017	PR2-755				T-115	R2232 †
B	100	50						MTH-5010	
C4A	■20	300	161-4020	AFH4-02-20		FP377.6	TMT-24	Q-050	TVL-4583
B	5	300				TC60	TD-4-450	MT-4504	
C	▲60	300							
D	▲10	300							
C5	2	50	161-1024	PRS50V2	BBR2-50	TC302	TD-2-50	MT-0502	TVA-1301
C6	25	25	161-1027	PRS25V25	BR252	TC26	TD-25-25	FM-0225	TVA-1205
C7	10	500	161-1010	PRS50V10	BR1250	TC82	TD-10-500	S-310	TVA-1963

Note 1. In some versions C2B is not used and C2A is a single unit (Part #161-1026)
* Replacement part numbers are for C2A only.
† Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C8	5									
C9	5									
C10	15									
C11	3.6									
C12	200									
C13	1000									
C14	800									
C15	800									
C16	120			NP0-D1120	TCZ-120	TZ32	TCO-120		5TCC-T12	
C17	5			NP0-D15		Z011	TCO-5	ZT-555		
C18	6.8			NP0-D16.8	TCZ-6R8	Z013	TCO-6.8	ZT-5568	5TCCB-V68	
C19	6.8			NP0-D16.8	TCZ-6R8	Z013	TCO-6.8	ZT-5568	5TCCB-V68	
C20	3-15									
C21	2.2			NP0-SI2.2	TCZ-2R2	Z006	TCO-2.2		5TCCB-V22	
C22	800									
C23	1.5			NP0-SI1.5	TCZ-1R5	Z004	TCO-1.5	ZT-5615	5TCCB-V15	
C24	1000			BPD-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C25	.5-3				829-3		3115-D	CT565A		
C26	800									
C27	1000			BPD-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C28	.5-5						532-A			
C29	60									
C30	1			NP0-SI1	TCZ-1	TZ03	TCO-1		5TCCB-V1	
C31	5									
C32	10									
C33	5									
C34	68			N705-DI68	TCN-68	N038	TC7-68		5TCU-Q68	
C35	1000			BPD-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C36	1000			BPD-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C37	800									
C38	800									
C39	1000			BPD-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C40	1000									
C41	800									
C42	.1	400	160-0601	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	Note 2
C43	.22	200	160-06022	P288N-22		CUB2P22		GEM-2022	2TM-P22	
C44	.1	200	160-0601	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C45	1000		166-1000D	BPD-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C46	750		160-0750	DI-00075	DD-751	G066	ED-750	UC-5375	5GA-T75	
C47	1000		166-1000D	BPD-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C48	750		160-0750	DI-00075	DD-751	G066	ED-750	UC-5375	5GA-T75	
C49	1000		160-1000D	DI-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C50	5		168-0008N	NP0-SI5	TCZ-4R7	Z011	TCO-5	ZT-555	5TCCB-V47	
C51	1000		160-1000D	BPD-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C52	.047	400	160-06147	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C53	1000		160-1000D	BPD-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C54	1000		160-1000D	BPD-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C55	1000		160-1000D	BPD-001	DD-102	K069	ED-001	DC-521	5HK-D1	
C56	10		160-0010P	NP0-SI10	TCZ-10	TZ09	TCO-10	ZT-541	5TCC-Q1	
C57	10		160-0010P	NP0-SI10	TCZ-10	TZ09	TCO-10	ZT-541	5TCC-Q1	
C58	47		160-0047P	NP0-SI47	TCZ-47	TZ22	TCO-47	ZT-5447	5TCC-Q47	
C59	.047	200	160-06147	BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	
C60	10		160-0010P	NP0-SI10	TCZ-10	TZ09	TCO-10	ZT-541	5TCC-Q1	

SET 341 FOLDER 15

SYLVANIA MODELS 21C401, 21C404, 21C405, 21C508, 21C509, 21T101, 21T102, 21T104, 21T105, 21T106, 21T110, 21T207, 21T208, 24T101, 24T201 Series (Ch. 1-532-3, -4, -5, -6, -7)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA SYLVANIA Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C61	.33	600	160-06033	P348H-33		CUB4P33		GEM-6033	47M-P33	
C62	470	500	183-04700	BPD-00047	DD-471	KD80	ED-00047	DC-5347	SCA-747	
C63	.047	1000	160-06147	BPD-05	DF 503	CUB2S47		GEM 2147	2TM-S47	
C64	.1*		160-00657P	NPO-6147	TCZ 47	TZ32	TCO-47	Z7-5447	STCC-Q47	
C65	4700		189-00033	BPD-0047	DD-472	KD79	ED-0047	DC-533	SNA-D47	
C66	4700		189-00025	BPD-0047	DD-473	KD79	ED-0047	DC-525	SNK-D47	
C67	.1	200	160-00656	P348H-1	DF-104	CUB2P1		GEM-2104	2TM-P1	
C68	.1	300	160-0001	P386H-1	DF-104	CUB2P1		GEM-3104	3TM-P1	
C69	100	500	189-00027	SDD6	DK-101	FWS7T	ED-108	MC335	LFM-S1	
C70	470	1000	189-00038	BPD-0047	DD-472	KD79	ED-0047	DC-525	SNK-D47	
C71	.01	600	189-00308	BPD-01	DD-103	KD65	ED-01	DC-511	SNK-61	
C72	1000	500	189-00204	BPD-062	DD-102	KD69	ED-001	DC-551	SNK-D1	
C73	150	500	183-0150	NPO-0150	D4-151	12R5Y15	ED-150	MCB350	MB-315	
C74	5		189-00320	NPO-515	TCZ-4R7	ZOU	TCO-5	Z7-555	STCCB-V47	
C75	.1	500	183-0033	NPO-6153	P4-330	12R5Z3	ED-33	DC-5433	STCC-Q33	
C76	470	500	183-04700	1484-00047	D6-471	5H57T47	ED-470		MB-347	
C77	.047	600	160-06247	BPD-05	DF-503	CUB3S47		GEM-4147	4TM-S47	
C78	.047	400	160-06147	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C79	.33	400	160-06233	P448H-33		CUB4P33		GEM-4033	4TM-P33	
C80	0033	200	160-06133	DI-0033	DK-332	CUB4D33	GP-3300	GEM-6233	6TM-D33	
C81	01	200	160-0611	DI-01	DK-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C82	033	200	160-06133	BPD-033	DD-332	CUB4S33	ED-33	GEM-4133	4TM-S33	
C83	001	400	160-0621	DI-001	DK-102	CUB6D1	GP-1000	GEM-621	6TM-D1	
C84	01	400	160-0611	DI-01	DK-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C85	033	200	160-06132	BPD-03	DF-303	CUB4S32	ED-33	GEM-4132	4TM-S32	
C86	1	600	160-0601							
C87	.01	600	160-0611	DI-01	DK-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C88	22	100	150-00012	P288N-22		CUB2P22		GEM-2032	2TM-P22	
C89	1	100	160-0601	P288N-1	DF-104	CUB2P1		GEM-2104	2TM-P1	
C90	001	200	160-0621	DI-001	DK-102	CUB4D1	GP-1000	GEM-621	6TM-D1	
C91	120	500	183-0120	NPO-61120	D4-121	12R5T12	ED-120		MB-312	
C92	001	200	160-0621	DI-001	DK-102	CUB4D1	GP-1000	GEM-621	6TM-D1	
C93	001	200	160-0631	DI-001	DK-102	CUB6D1	GP-1000	GEM-621	6TM-D1	
C94	4.4		189-00326							
C95	15	200	189-0038	P288N-15		CUB2P15		GEM-2015	2TM-P15	
C96	001	500	183-0061	DI-001	DK-102	CUB5D1	GP-1000	GEM-621	6TM-D1	
C97	470	500	183-0470	1484-00047	DK-471	5R57T47	ED-470		MB-347	
C98	.0047	600	189-0039	DI-0047	DK-472	CUB5D47	GP-4700	GEM-6247	6TM-D47	
C99	.005	500	183-0050	1484-00058	DK-561	5R57S6	ED-560		MB-358	
C100	001	500	183-0631	DI-001	DK-102	CUB5D1	GP-1000	GEM-621	6TM-D1	
C101	.047	400	160-06147	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C102	.047	600	160-06147	BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C103	1000		189-00324	BPD-001	DD-102	KD69	ED-001	DC-521	5HK-D1	
C104	1000		189-00060	BPD-001	DD-102	KD69	ED-001	DC-521	5HK-D1	
C105	1000		189-00060	BPD-001	DD-102	KD69	ED-001	DC-521	5HK-D1	
C106	1000	1	189-00060	BPD-001	DD-102	KD69	ED-001	DC-521	5HK-D1	
C107	1000		189-00060	BPD-001	DD-102	KD69	ED-001	DC-521	5HK-D1	
C108	1000		189-00060	BPD-001	DD-102	KD69	ED-001	DC-521	5HK-D1	
C109	1000		189-00060	BPD-001	DD-102	KD69	ED-001	DC-521	5HK-D1	Note 2

Note 2. Not used in some versions.

CONTROLS

ITEM No.	RATING RESIST ANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	250K	½	152-0032	AB-51	A47-250K-2	Q2B-250	U44	Volume control - Note 1
B	Shaft		Not Req.	AK-4		Not Req	Not Req	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	T8-1	U8-26	Attach to R1A
R2A	50K	½	154-0033					Horiz. Hold - Note 2
B	250K	½	Not Req.					Horiz. Range
R3A	750Ω		152-0077	AB-415		Q1T-105	U3	Contrast - Note 3
B	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R3A
R4A	1Meg	½	153-0074	• AB-59	•A47-1Meg-B	•Q1L-136	•TA16L	Brightness - Note 4
	with 330Ω stop							
B	Shaft		Not Req	AK-4	KBB-3	Not Req.	Not Req.	Attach to R4A
R5A	1Meg	½	153-0081	AB-59	A47-1Meg-B	Q1L-137	U54	Vert. Hold - Note 5
B	Shaft		Not Req	AK-4	KBB-3	Not Req.	Not Req.	Attach to R5A
R6A	500K	½	153-0082	AB-58	A47-500K-B	Q1L-135	U50	Fringe control - Note 6
B	Shaft		Not Req	AK-4	KBB-3	Not Req.	Not Req.	Attach to R6A
R7A	1 Meg	½	153-0070	AB-743	A47-1 Meg -G	Q1L-133	PTA1RL	Height control
B	Shaft		Not Req	AK-4	KB-3	Not Req.	Not Req.	Attach to R7A
R8A	1500Ω	2	153-0071	AW-150	W-150	WP8-1500	R1500L	Vert. Linearity - wire wound
B	Shaft		Not Req	Not Req.	KBB-3	Not Req.	Not Req.	Attach to R8A

• Connect a 330K resistor in series with the off hot lead terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).
Note 1. Alternate control part #197-0048 used in Chassis 1-532-5, -6, -7.
Note 2. Alternate control part #154-0064 used in Chassis 1-532-5, -6, -7.
Note 3. Alternate control part #153-0088 used in Chassis 1-532-5, -6, -7.
Note 4. Alternate control part #153-0065 used in Chassis 1-532-5, -6, -7.
Note 5. Alternate control part #153-0087 used in Chassis 1-532-5, -6, -7.
Note 6. Alternate control part #153-0068 used in Chassis 1-532-5, -6, -7.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA Part No.	IRC Part No.	NOTES
R9	680K			BTB-680K	
R10	390K			BTB-390K	
R11	10K			BTB-10K	
R12	680K			BTB-680K	
R13	22K		181-0223	BTS-22K	
R14	560K			BTB-560K	
R15	470K		181-0474	BTB-470K	
R16	680Ω		181-0681	BTS-680	
R17	4700Ω			BTB-4700	
R18	330KΩ			BTB-330K	
R19	1000Ω		181-0109	BTS-1000	
R20	47K			BTB-47K	
R21	10K			BTB-10K	
R22	3300Ω	1		BTA-3300	
R23	100K		181-0104	BTS-100K	
R24	6.8Meg	½		BTA-6.8Meg	
		5%			
R25	220K		181-0224	BTS-220K	
R26	82K	5%	181-08245	BTS-820K 5%	
R27	150K	5%	181-01545	BTS-150K 5%	
R28	82K	5%	181-08245	BTS-820K 5%	
R29	2700Ω	5%	181-02745	BTS-2700 5%	
R30	3300Ω	2	183-0333	BTB-3300	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA Part No.	IRC Part No.	NOTES
R34	22K		181-0223	BTS-22K	
R35	15Meg		181-0158	BTS-15Meg	
R36	220K		181-0224	BTS-220K	
R37	470K		181-0474	BTS-470K	
R38	1000Ω		181-0102	BTS-1000	
R39	470Ω	2	183-0471	BTA-470	
R40	270Ω	1	183-0271	BTA-270	
R41	15K		181-0153	BTS-15K	
R42	33K		181-0333	BTS-33K	
R43	100K		181-0104	BTB-100K	
R44	330K		181-0334	BTB-330K	
R45	39K	½	183-0393	BTB-39K	
R46	560K 5%		181-05645	BTS-560K 5%	
R47	680K 5%		181-06845	BTS-680K 5%	
R48	560K 5%		181-05645	BTS-560K 5%	
R49	39K		181-0393	BTS-39K	
R70	390K		181-0394	BTS-390K	
R71	220K		181-0224	BTS-220K	
R72	56K		181-0563	BTS-56K	
R73	470K		181-0474	BTS-470K	
R74	6800Ω	2	183-0682	BTB-6800	
R75	22K		181-0223	BTS-22K	
R76	82K		181-0823	BTS-82K	
R77	390Ω		181-0392	BTS-390	
R78	47K		181-0473	BTS-47K	
R79	1000Ω		181-0103	BTS-1000	
R80	390K		181-0394	BTS-390K	
R81	3.3Meg		181-0335	BTS-3.3Meg	
R82	390Ω	½	181-03925	BTS-390Ω ½	
R83	33K		181-0333	BTS-33K	
R84	1Meg		181-0105	BTS-1Meg	
R85	560K		181-0564	BTS-560K	
R86	820K		181-0824	BTS-820	
R87	120K	1	182-0124	BTA-120K	
R88	100Ω		181-0101	BTS-100	
R89	120Ω	1	182-0121	BTA-120	
R90	270K		181-0274	BTS-270K	
R91	220Ω		181-0221		

Note 1. Chassis 1-532-5, -6, -7 use a 22K, 1W resistor in this application.
Note 2. Chassis 1-532-5, -6, -7 use a 18K, 1W resistor in this application.
Note 3. In the production of chassis 1-532-5, -6, -7 a single 820Ω resistor is used in this application
Note 4. Chassis 1-532-5, -6, -7 use a 1Ω resistor in this application
Note 5. Not used in Chassis 1-532-5, -6, -7 and some versions of Chassis 1-532-3, -4.
Note 6. Not used in Chassis 1-532-5, -6, -7.
Note 7. Not used in Chassis 1-532-3, -4
Note 8. Not used in Chassis 1-532-5, -6, -7 and some versions of Chassis 1-532-3, -4
Note 9. Some versions use a 470Ω, 2W resistor in this application.

TRANSFORMER (HALOLIGHT)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA SYLVANIA Part No.	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordorson Part No.	Tried Part No.
T1	117VAC ⑤ ⑭	660VCT			141-0065 ① 141-0066 ②					

① Used in Models with 21" picture tubes.
② Used in Models with 24" picture tubes.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	SYLVANIA Part No.	Halldorson Part No.	Merit Part No.	RCA TYPE No.	Ram Part No.	Stancor Part No.	Thordorson Part No.	Tried Part No.
T2	Horiz. Output Trans.	141-0038 ① 241-0041 ②	FB419 • ⑧	HOV-54 • ⑨		X139 • ⑧	A-8355 • ⑧	FLY-76 • ⑧D-49 • ⑧	
T3	Vert. Output Trans.	141-0039 ①	21005 ⑪	A-2822 ⑨		V34 ⑧	A-8147 ⑧	26571 ⑧	
T4A	Yoke (90°) Horiz	100-0025	DF607 ⑦	MDY-92	23501?	T99P19 43	DY-16A ⑫	Y-18 ⑫ ⑬	Y-41-1 ⑫
B	Vert. (61MCM)	100-0029 ①	⑬	⑨	⑬	⑬	⑬	⑬	
T5	Width Coil (6-9.5MM)	133-0011	RF604 ⑩	MWC-3 ⑨	20581	30JR15A	WC-7	WC-33	WC-15

① Used in Chassis 1-533-5, -6 and later versions of Chassis 1-532-5, -6, -7.
② Used in Chassis 1-532-5, -6, -7, early versions.
③ Drill new mounting hole(s).
④ Connect to auto transformer.
⑤ Use 8 in 1 turns ratio.
⑥ Used in 24" models only.
⑦ Use original core clamp and associated components
⑧ Connect horizontal yoke terminal #3 to yoke plug pin #1. Horiz. yoke terminal #1 to yoke plug pin #3.
⑨ Connect horizontal yoke damping network across terminals #5 and #7.
⑩ Drill new mounting hole or use original slider and core arrangement.
‡ This part may be superseded by Part Manufacturer's introduction of a special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Tried Replacement Connections
4	9	8	5	5	5	5	5
8	7	4	4	4	4	6	6
2	7	4	4	4	4	6	6
1	1	1	1	1	1	1	2
9	6	7	7	7	7	7	3
8	2	8	8	8	8	4	4
Special Notes	⑪	⑪ ⑫	⑪	⑪	⑪ ⑫	⑪ ⑫	⑪

⑪ If the picture is out of phase, reverse AFC winding
⑫ Requires 2 turns on filament winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA SYLVANIA Part No.	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordorson Part No.	Tried Part No.	NOTES
T6	5.6K	3-4Ω	143-0047	Z1000	A-2030	A-3850	24851	S-3X	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP	REPLACEMENT DATA SYLVANIA Part No.	QUAM Part No.	RCA TYPE No.	NOTES
SP1	5-3/4"	PM	3-4Ω	539-0578 ①	52A1	217S1	① Used in Models 21T101, 21T102M, M1, 21T102, 21T402, 21T403, 21T502, 21T503, 21T602, 21T603, 24T101, 24T102, 24T103, 24T201, 24T202, 24T203
	6" x 6"	PM	3-4Ω	539-0808 ② 539-4600 ②			② Used in Models 21C401, 21C404, 21C405, 21C508, 21C509, 21T101, 21T102, 21T104, 21T105, 21T106, 21T110, 21T207, 21T208, 24T101, 24T201 Series (Ch. 1-532-3, -4, -5, -6, -7)

COILS (RF-IF)

ITEM No.	USE	SYLVANIA Part No.	NOTES
L1A	VHF RF, Mixer Grid & Osc. Coils	110-6002	Channel 2
B	VHF RF, Mixer Grid & Osc. Coils	110-6003	Channel 3
C	VHF RF, Mixer Grid & Osc. Coils	110-6004	Channel 4
D	VHF RF Mixer Grid & Osc. Coils	110-6005	Channel 5
E	VHF RF, Mixer Grid & Osc. Coils	110-6006	Channel 6
F	VHF RF, Mixer Grid & Osc. Coils	110-6007	Channel 7
L2	1st. Video IF	.1Ω	119-0010	
L3	Fil. Choke	0Ω	147-0014	19-3001	TV-180	6175	.7 Microhenry
L4	2nd Video IF	.1Ω	.1Ω	118-0003	17-5002	TV-127	6233	
L5	Fil. Choke	0Ω		147-0014	19-3001	TV-189	6175	.7 Microhenry
L6	3rd Video IF	.1Ω	.1Ω	118-0009	17-5004	TV-125	6234	
L7	4th Video IF	.3Ω	.3Ω	118-0011	17-5004	TV-130	6234	
L8	RF Coil	6.8Ω		131-2038	17-3125 *	TV-182	6183 *	120 Microhenries, wound on 270 Resistor
L9	Series Peaking Coil	1.3Ω		118-0020	19-1001		6804	1.5 Microhenries
L10	4.5MC Trap	1.1Ω		118-0019	20-1004	TV-151	1489	
L11	Series Peaking Coil			146-0016				Note 1
L13 A	Series Peaking Coil	8.8Ω		131-3027				
B	Shunt Peaking Coil	14.5Ω		130-0002				Tapped ⑤ .4Ω
L14	Ratio Det.	1Ω	1.2ΩCT	128-0012	17-3498			Tertiary winding -1.1Ω
L15	RF Choke	1.6Ω		118-0008	19-1005		4612	9.6 Microhenries
L16	RF Choke	1.6Ω		118-0010	19-1005		4612	9.6 Microhenries
L17	RF Choke	1.6Ω		118-0010	19-1005		4612	9.6 Microhenries

Note 1. Not used in Chassis 1-532-3, -4.
* Parallel with 27K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI	SEC.	REPLACEMENT DATA SYLVANIA Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	RCA TYPE No.	Ram Part No.	Thordorson Part No.	NOTES
L18	31Ω		132-0001	19-1516 *	TV-163 *	6310 *			RH-5 *	

* Exhange mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE @ CURRENT 1000 Cycles	REPLACEMENT DATA SYLVANIA Part No.	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordorson Part No.	Tried Part No.
L19	.320A	27Ω	1 HY	145-0020	C5041		C-2325	26C44	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA Part No.	REPLACEMENT DATA NOTES
X1	De-Emphasis Network	22K, 1000MMF, 4000MMF	190-0037	Aerovox PA434 Centralab Cornell-Dubilier Erie Sprague

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	SYLVANIA Part No.	FEDERAL Part No.	INTERNATIONAL Part No.	MALLORY Part No.	RADIO RECEPTOR Part No.	SARKES TARZIAN Part No.	NOTES
M1	.320A	51T-0010	U78A	R8450BL	68450	682	500	
M2	.320A	51T-0010	U78A	R8450BL	68450	682	500	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA SYLVANIA Part No. FUSE	HOLDER	LITTELFUSE Part No. FUSE	HOLDER	BUSS Part No. FUSE	HOLDER
M3	C	3¼ 250V	181-0032	562-0011	312015 .5 (C 3¼)	346006	C3½	HC 1 3/4 to 2 1/2
M4	3AG	1.4A 250V	181-0033	487-0008	312.250 (3AG 1/4A)	357001	AGC 1/4	4405

SYLVANIA MODELS 21C401, 21C404, 21C405, 21C508, 21C509, 21T101, 21T102, 21T104, 21T105, 21T106, 21T110, 21T207, 21T208, 24T101, 24T201 Series (Ch. 1-532-3, -4, -5, -6, -7)

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

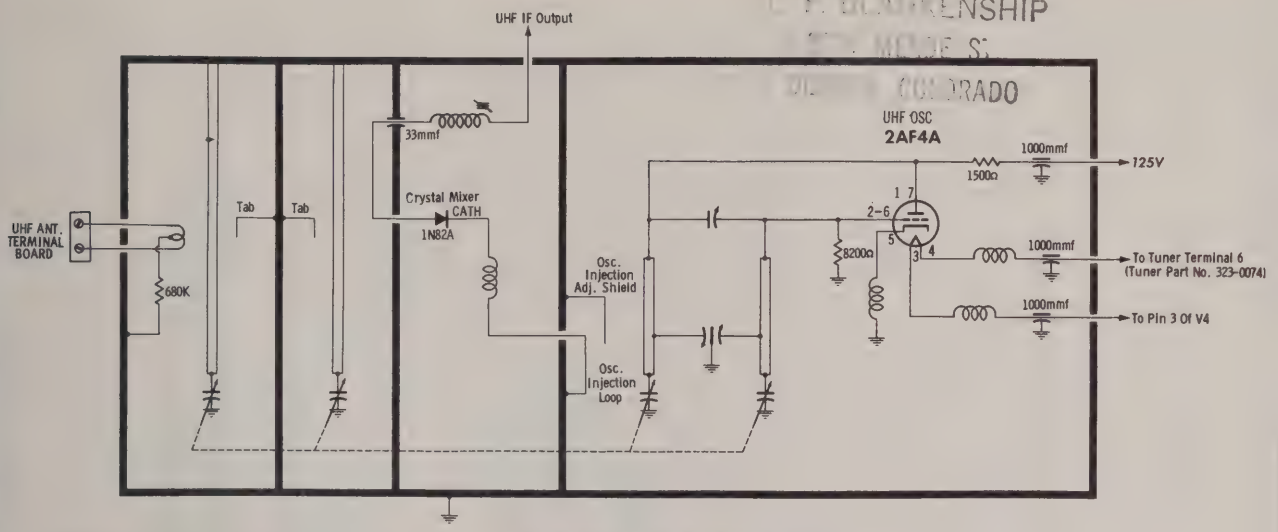
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		SYLVANIA PART No.	SYLVANIA PART No.	
M5	1N82A		1N82A	UHF Mixer (Clip in)

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M6	HaloLight Tube	611-2105	Used in Models 21T102, MU, 21T106, 21T110, 21C104, 21C405
	HaloLight Tube	611-2104	Used in Models 21T104, 21C404, 21T207, 21T208, 21C508, 21C509
	HaloLight Tube	611-2402	Used in Models 24T101, 24T201
M7	Tuner	323-0072	UHF/VHF - Used in UHF/VHF versions of chassis 1-532-3,-4
	Tuner	323-0071	VHF - Used in "VHF Only" versions of chassis 1-532-3, -4
	Tuner	323-0074	VHF - Used in chassis 1-532-5
	Tuner	323-0075	VHF - Used in chassis 1-532-6
	Tuner	323-0081	VHF - Used in chassis 1-532-7
	Tuner	323-0073	UHF - Used in UHF/VHF versions of chassis 1-532-5, -6, -7
	Tuner	323-0079	VHF - Used in some versions of Chassis 1-532-3, -4
M8	Switch	571-0014	On-off - Used in chassis 1-532-5, -6, -7
M9	Ion Trap	400-0027	
M10	Centering Device	400-0025	
M11	Correction Magnet		
	Knob	744-0033	Brightness - Used in Models 21T101, 21T102, MU, 21T104, 21T105, 21T106, 21C401, 21C404, 24T101
	Knob	744-0045	Brightness - Used in Models 21T110, 21C405
	Knob	744-0032	Contrast - Used in Models 21T101, 21T102, MU, 21T104, 21T105, 21T106, 21C401, 21C404, 24T101
	Knob *	740-0098	Fine tuning - "VHF Only" Models 21T101, 21T102, MU, 21T104, 21T105, 21T106, 21C401, 21C404, 24T101
	Knob †	740-0099	Fine tuning - UHF/VHF Models 21T101, 21T102, MU, 21T104, 21T105, 21T106, 21C401, 21C404, 24T101
	Knob	744-0031	Horiz. Hold - Used in Models 21T101, 21T102, MU, 21T104, 21T105, 21T106, 21C401, 21C404, 24T101
	Knob	744-0045	Horiz. Hold - Used in Models 21T110, 21C405
	Knob	740-0097	On-off Volume - Used in Models 21T101, 21T102, MU, 21T104, 21T105, 21T106, 21C401, 21C404, 24T101
	Knob	744-0044	On-off Volume - Used in Models 21T110, 21C405
	Knob ††	743-0039	UHF Channel Selector - Used in Models 21T101, 21T102, MU, 21T104, 21T105, 21T106, 21C401, 21C404, 24T101
	Knob **	743-0037	VHF Channel Selector - "VHF Only" Models 21T101, 21T102, MU, 21T104, 21T105, 21T106, 21C401, 21C404, 24T101
	Knob #	743-0038	VHF Channel Selector - UHF/VHF Models 21T101, 21T102, MU, 21T104, 21T105, 21T101, 21C401, 21C404, 24T101
	Knob ■	744-0034	Vert. Hold - Used in Models 21T101, 21T102, MU, 21T104, 21T105, 21T106, 21C401, 21C404, 24T101
	Knob	740-0116	Brightness, contrast, fine tuning, range, vert. hold, volume, UHF channel selector - Used in Models 21T207, 21T208, 21C508, 21C509, 24T201
	Knob	740-0117	Slide Type - on-off , VHF channel selector - Used in Models 21T207, 21T208, 21C508, 21C509, 24T201
	Glass	710-0021	Safety (Clear) - Used in Model 21T101
	Glass	710-0028	Safety (Clear) - Used in Models 21T105, 21T106
	Glass	710-0029	Safety (Clear) - Used in Models 21T208, 21C509
	Glass	710-0030	Safety (Clear) - Used in Model 24T201
	Glass	710-0022	Safety (Filter) - Used in Models 21T102, MU, 21T110, 21C401, 21C405
	Glass	710-0018	Safety (Filter) - Used in Model 21T104
	Glass	710-0027	Safety (Filter) - Used in Models 21T105, 21T106
	Glass	710-0024	Safety (Filter) - Used in Model 21C404
	Glass	710-0023	Safety (Filter) - Used in Model 24T101
	Glass	710-0031	Safety (Filter) - Used in Models 21T207, 21C508

* Models 21T110 and 21C405 use alternate part #740-0110.
† Models 21T110 and 21C405 use alternate part #740-0109.
†† Models 21T110 and 21C405 use alternate part #743-0047.
** Models 21T110 and 21C405 use alternate part #743-0046.
# Models 21T110 and 21C405 use alternate part #743-0048.
■ Models 21T110 and 21C405 use alternate part #744-0045.

PROPERTY OF
L. F. BLANKENSHIP
COLORADO



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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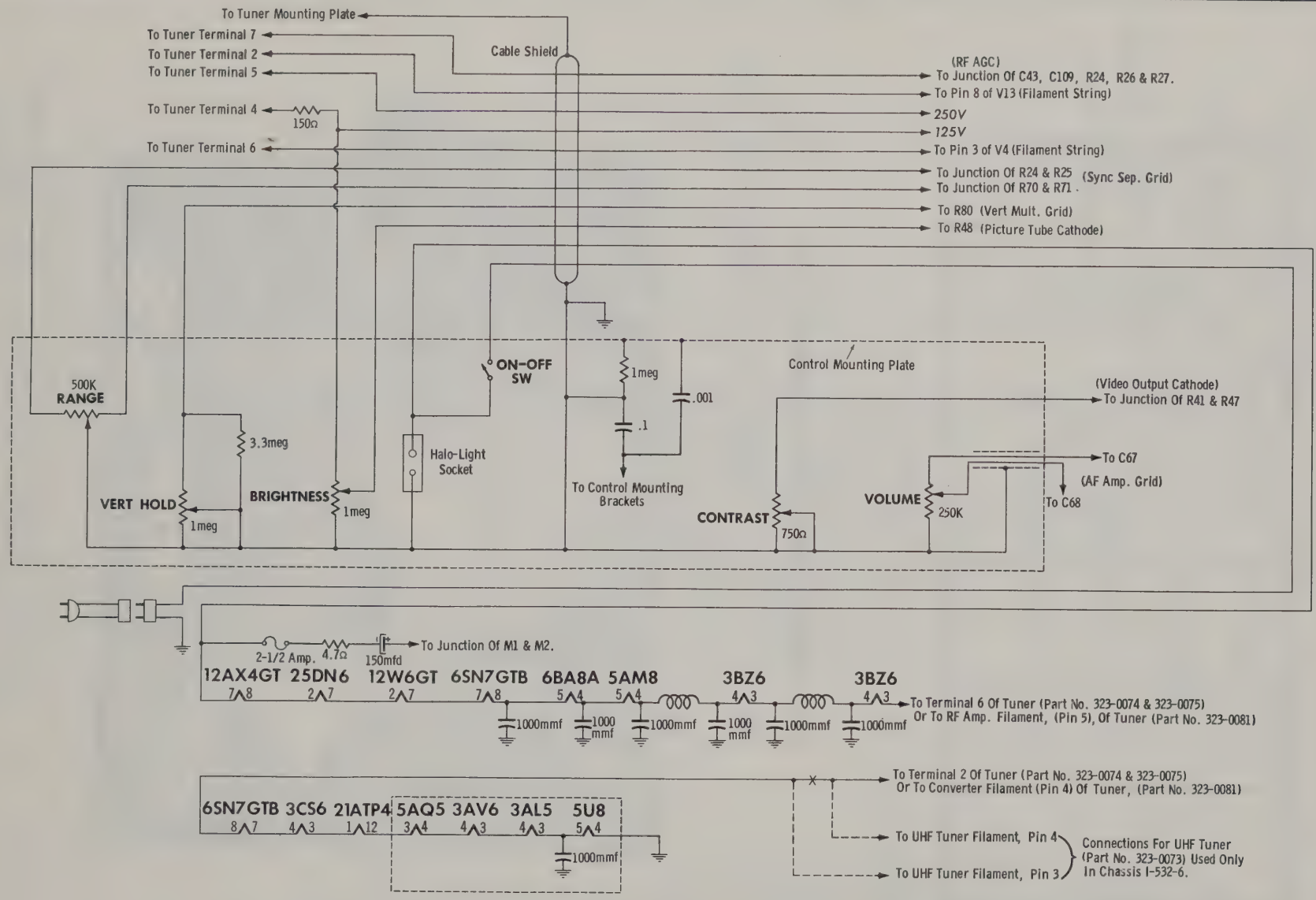
UHF Tuner Part No. 323-0073 Used With Chassis 1-532-5, -6.

ALTERNATE UHF TUNER SCHEMATIC

CHASSIS TOP VIEW


To Tuner Mounting Plate
To Tuner Terminal 7
To Tuner Terminal 2
To Tuner Terminal 5
To Tuner Terminal 4
150Ω
To Tuner Terminal 6
Cable Shield
(RF AGC)
To Junction Of C43, C109, R24, R26 & R27.
To Pin 8 of V13 (Filament String)
250V
125V
To Pin 3 of V4 (Filament String)
To Junction Of R24 & R25 (Sync Sep. Grid)
To Junction Of R70 & R71.
To R80 (Vert Mult. Grid)
To R48 (Picture Tube Cathode)
ON-OFF SW
1meg
.001
.1
Control Mounting Plate
(Video Output Cathode)
To Junction Of R41 & R47
500K RANGE
3.3meg
Halo-Light Socket
To Control Mounting Brackets
To C67
(AF Amp. Grid)
To C68
VERT HOLD
1meg
BRIGHTNESS
1meg
CONTRAST
750Ω
VOLUME
250K
2-1/2 Amp.
4.7Ω
150mfd
To Junction Of M1 & M2.
12AX4GT 25DN6 12W6GT 6SN7GTB 6BA8A 5AM8 3BZ6 3BZ6
7∧8 2∧7 2∧7 7∧8 5∧4 5∧4 4∧3 4∧3
1000mmf 1000 mmf 1000mmf 1000 mmf 1000mmf 1000mmf
To Terminal 6 Of Tuner (Part No. 323-0074 & 323-0075)
Or To RF Amp. Filament, (Pin 5), Of Tuner (Part No. 323-0081)
6SN7GTB 3CS6 21ATP4 5AQ5 3AV6 3AL5 5U8
8∧7 4∧3 1∧12 3∧4 4∧3 4∧3 5∧4
1000mmf
To Terminal 2 Of Tuner (Part No. 323-0074 & 323-0075)
Or To Converter Filament (Pin 4) Of Tuner, (Part No. 323-0081)
To UHF Tuner Filament, Pin 4
To UHF Tuner Filament, Pin 3
Connections For UHF Tuner (Part No. 323-0073) Used Only In Chassis I-532-6.

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AC Input, Control Panel & Filament Wiring
Used In Chassis 1-532-5-6 & -7.

ALTERNATE CONTROL & FILAMENT CIRCUIT SCHEMATIC

ALTERNATE VHF TUNER SCHEMATIC

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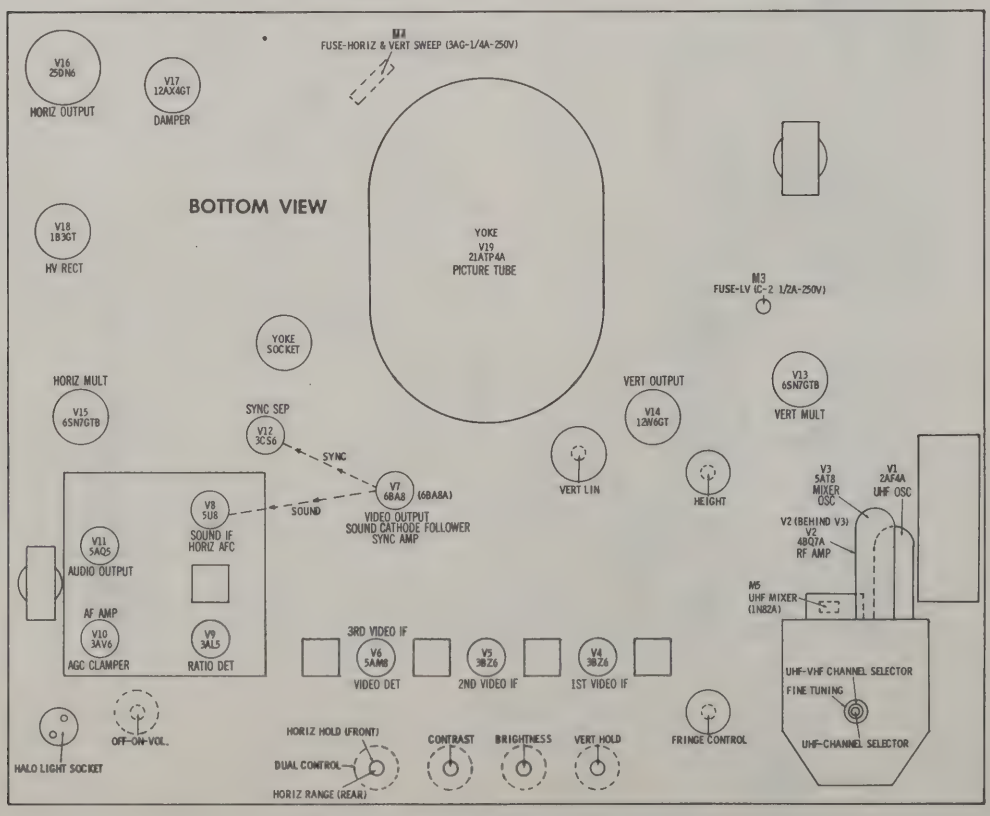
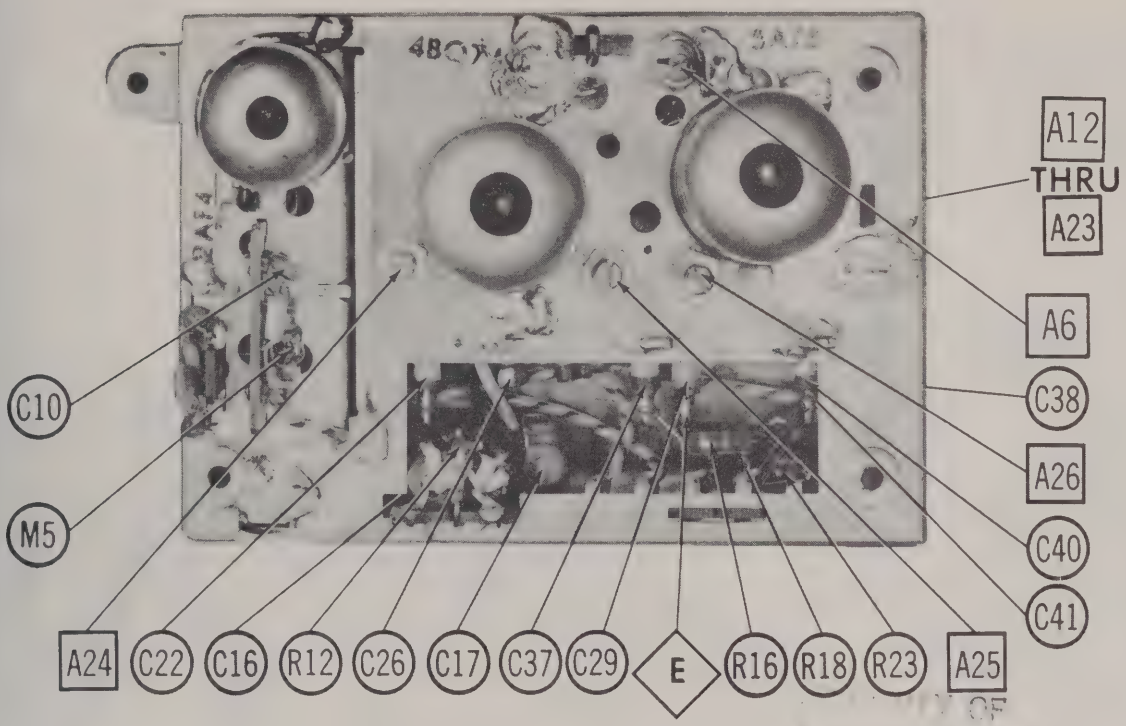
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2AF4	†‡4800Ω	10K	12.5Ω	12Ω	0Ω	10K	†‡4800Ω		
V2	4BQ7A	INF	350K	0Ω	13Ω	12.5Ω	†1400Ω	†250K	INF	0Ω
V3	5AT8	10K	†4800Ω	0Ω	14Ω	13Ω	†2200Ω	†48K	0Ω	220K
V4	3BZ6	300K	47Ω	12Ω	11Ω	†4000Ω	†4000Ω	0Ω		
V5	3BZ6	.1Ω	47Ω	11Ω	10Ω	†4000Ω	†4000Ω	0Ω		
V6	5AM8	180Ω	27K	†5000Ω	10Ω	9Ω	†4700Ω	.3Ω	3500Ω	0Ω
V7	6BA8	.4Ω	12K	†25K	9Ω	7.5Ω	● 120Ω	470K	†33K	†4100Ω
V8	5U8	270K	1.5Ω	†2800Ω	0Ω	1Ω	†2800Ω	150Ω	47K	4700Ω
V9	3AL5	INF	INF	1Ω	2Ω	0Ω	0Ω	22K		
V10	3AV6	15Meg	0Ω	2Ω	2.5Ω	350K	0Ω	†220K		
V11	5AQ5	470K	270Ω	3.5Ω	2.5Ω	†1000Ω	†500Ω	470K		
V12	3CS6	● 450K	0Ω	5.5Ω	6.5Ω	†50K	†8500Ω	1Meg		
V13	6SN7GTB	3900Ω	†47K	1000Ω	700K	*650K	1000Ω	15Ω	14Ω	
V14	12W6GT	NC	17Ω	†400Ω	†500Ω	● 1.2Meg	NC	15Ω	● 300Ω	
V15	6SN7GTB	1.2Meg	†8200Ω	820Ω	● 230K	†48K	820Ω	6.5Ω	7.5Ω	
V16	25DN6	NC	25Ω	0Ω	TP	600K	TP	17Ω	†8500Ω	TOP CAP *36Ω
V17	12AX4GT	NC	TP	1Meg	NC	†30Ω	TP	28Ω	25Ω	
V18	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP *576Ω
V19	21ATP4	5.5Ω	1Meg	PIN 6 †100K	PIN 10 *100K	PIN 11 ● 380K	PIN 12 3.5Ω			

‡ MEASURED IN UHF POSITION.
† MEASURED FROM OUTPUT OF M2.
* MEASURED FROM PIN 3 OF V17.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION
TP TIE POINT

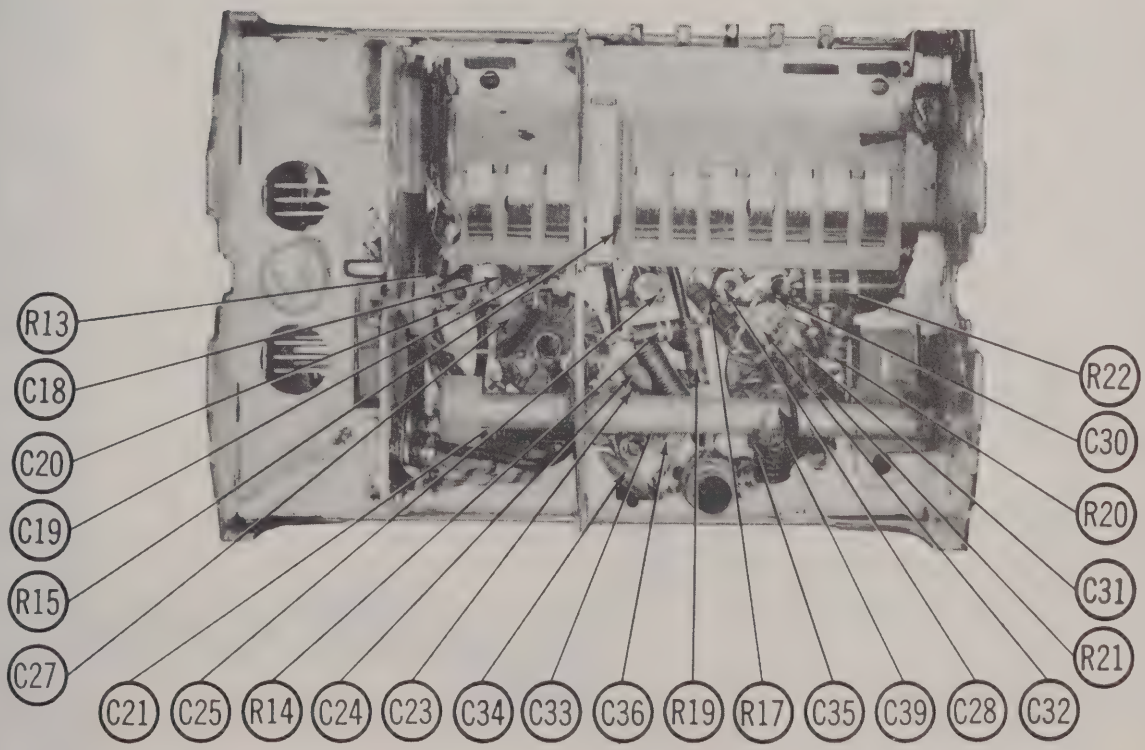


TUBE PLACEMENT CHART

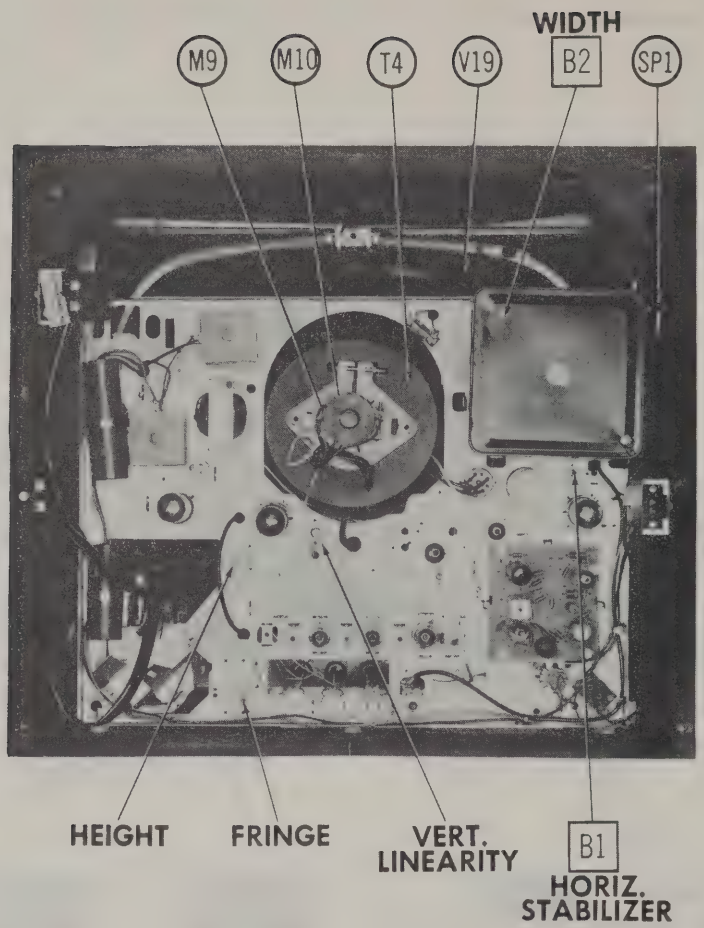


RF TUNER-TOP VIEW

DENVER, COLORADO



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

To adjust the horizontal AFC circuit proceed as follows:

1. Short pin 5 (plate) of 3CS6 (V12) to chassis with a clip lead.

2. Connect a jumper across the terminals of the horizontal frequency coil (L18).

3. Set the horizontal hold control to its mid-range position.

4. Adjust the horizontal range control until the picture moves back and forth across the screen with the blanking bar vertical.

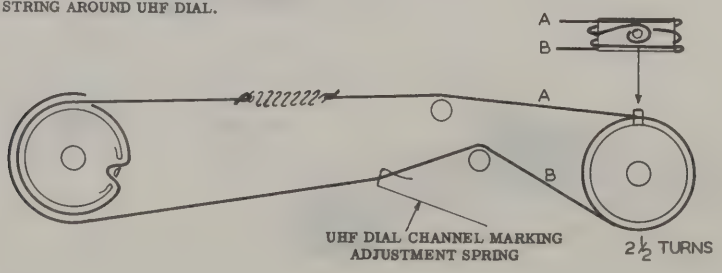
5. Remove the short from L18. Adjust the horizontal frequency slug (B1) until the picture again moves back and forth across the screen with the blanking bar vertical.

6. Remove the short from V12.

7. Set the contrast control fully counter clockwise and turn the horizontal hold control for best lock-in action.

8. Set the contrast control for normal picture and check for proper lock-in action on all available channels. If necessary, SLIGHTLY readjust the horizontal hold control.

POSITION UHF DIAL WITH CHANNEL 45 MARKING CENTERED IN DIAL WINDOW BEFORE PLACING STRING AROUND UHF DIAL.



UHF DRIVE CORD STRINGING

L. F. ANKENSHIP
[illegible] MEADE ST.
DENVER, COLORADO

TELEFUNKEN MODEL
Opus No. 6 (Ch. A, B)

TELEFUNKEN MODEL
Opus No. 6 (Ch. A, B)

TRADE NAME	Telefunken Model Opus 6 (Ch. A, B)		
SUPPLIER	American Elite, Inc., 7 Park Ave., New York, N. Y.		
TYPE SET	AC Operated FM-AM-SW Receiver		
TUBES	Nine		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING	.63 Amp. @ 117 Volts AC

TUNING RANGE

SPECIAL	145KC - 320KC	SHORT WAVE	16. 2-50. 8METERS
BROADCAST	515KC - 1620KC	FREQ. MOD.	88MC-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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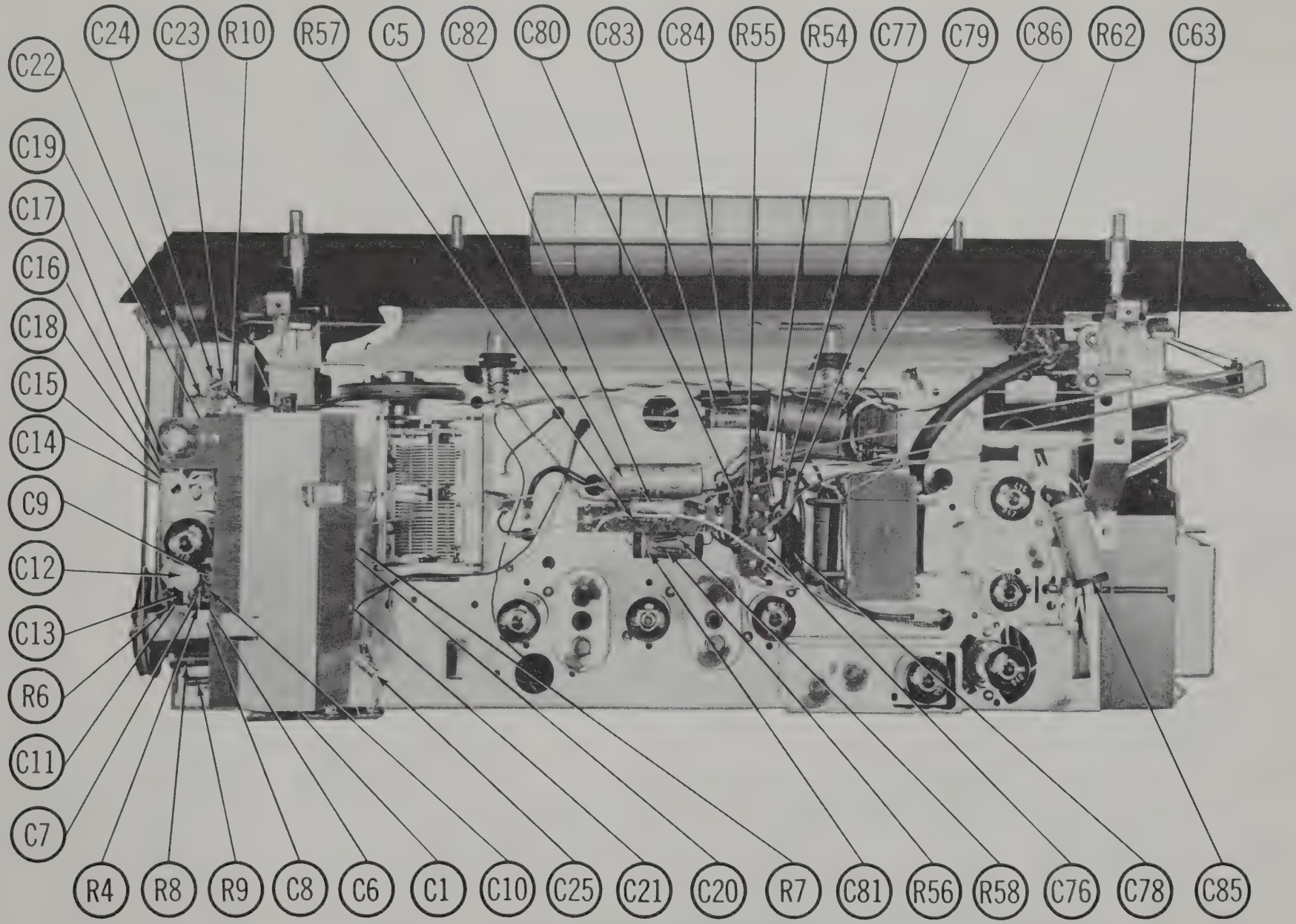
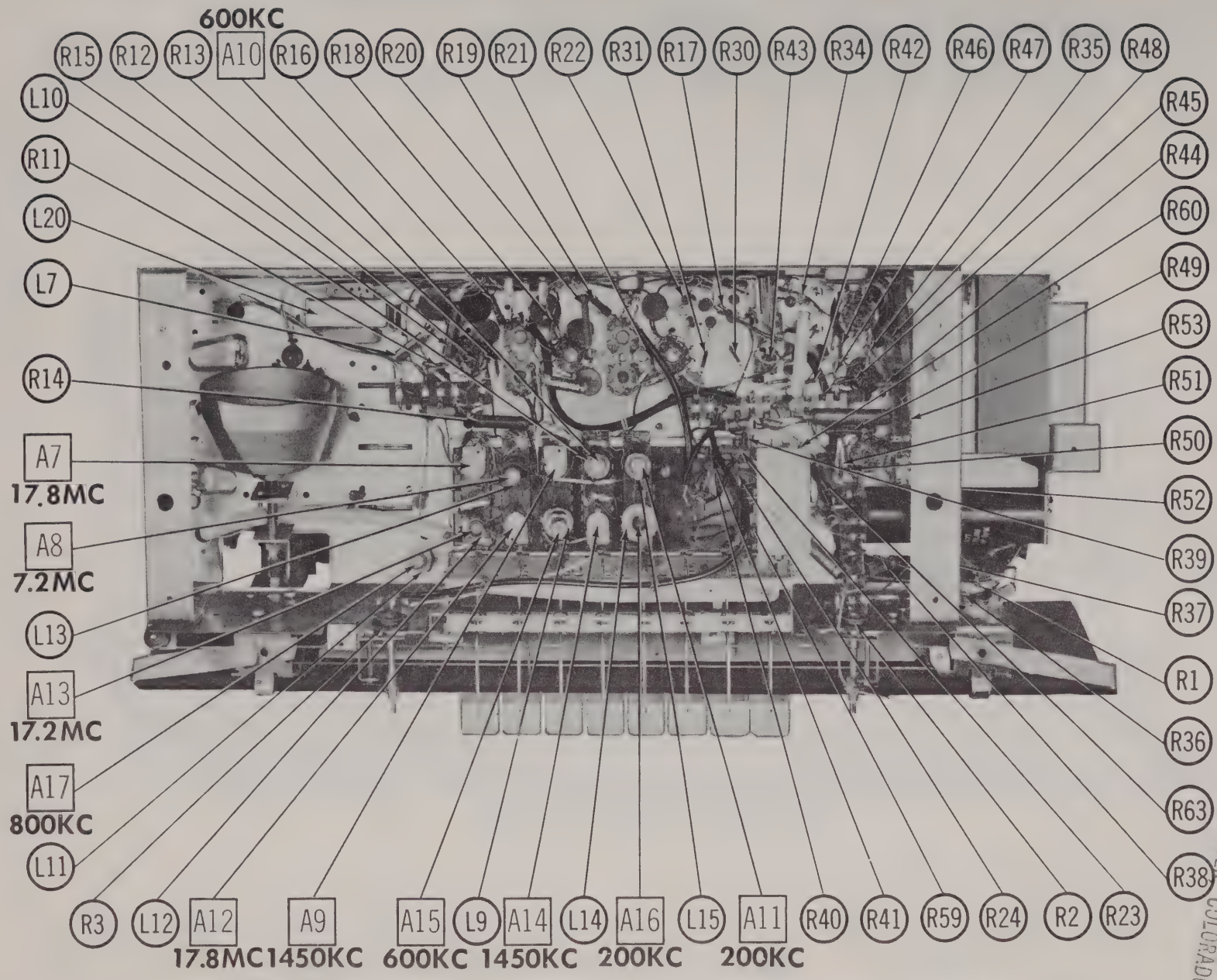
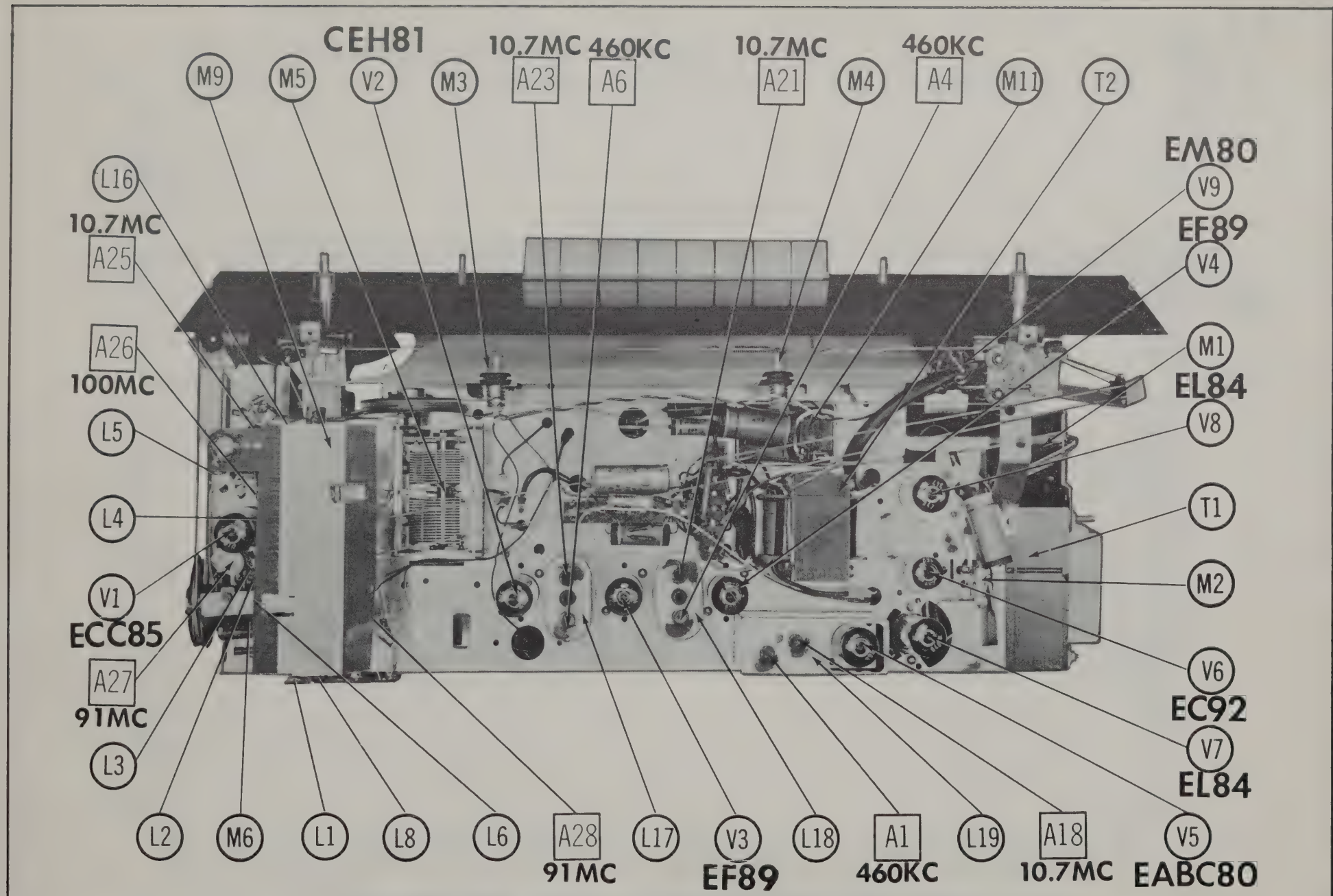


CHASSIS TOP VIEW - CAPACITOR AND RESISTOR IDENTIFICATION

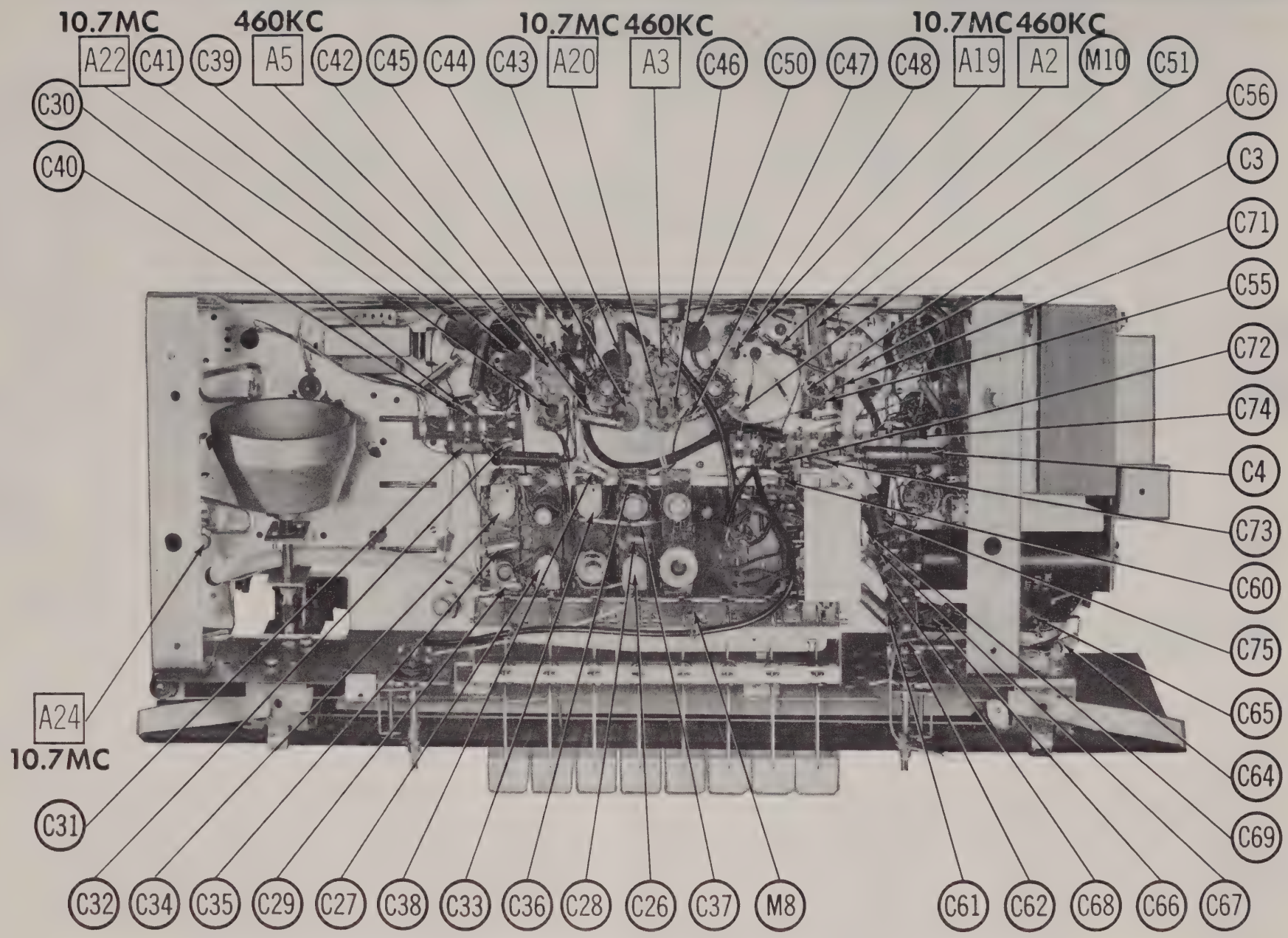


CHASSIS BOTTOM VIEW - RESISTOR AND ALIGNMENT IDENTIFICATION

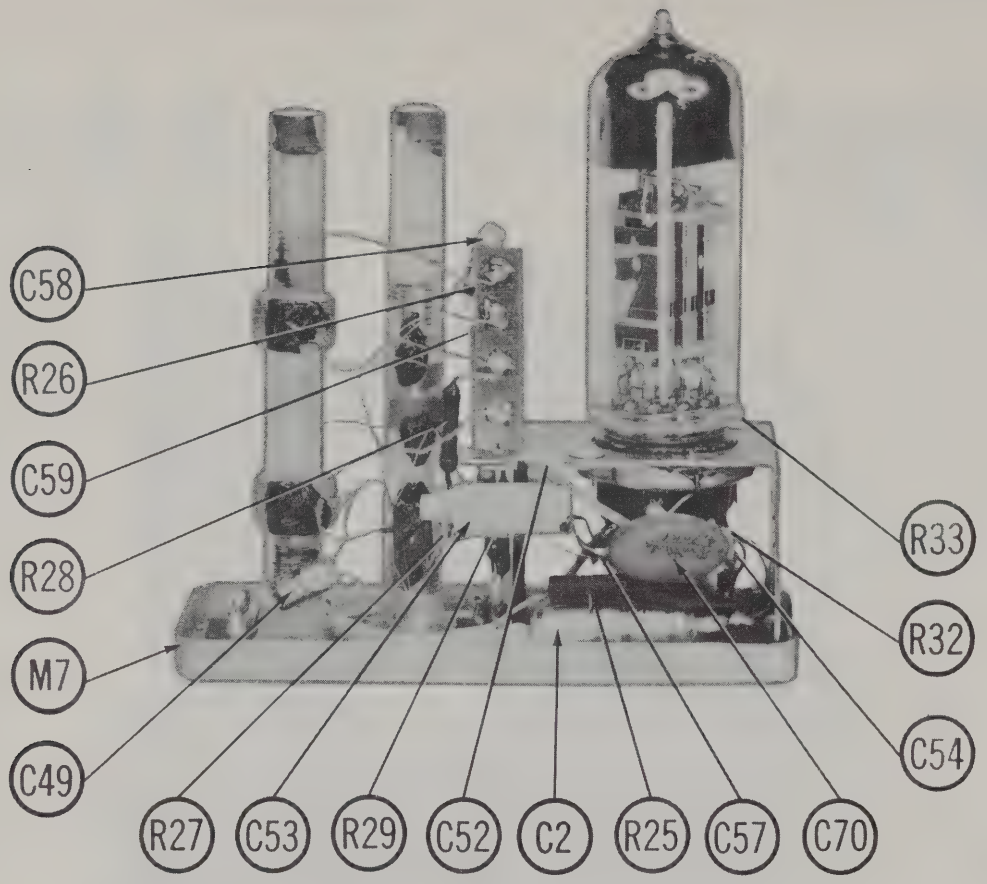
3924 MEADE ST.
DENVER, COLORADO



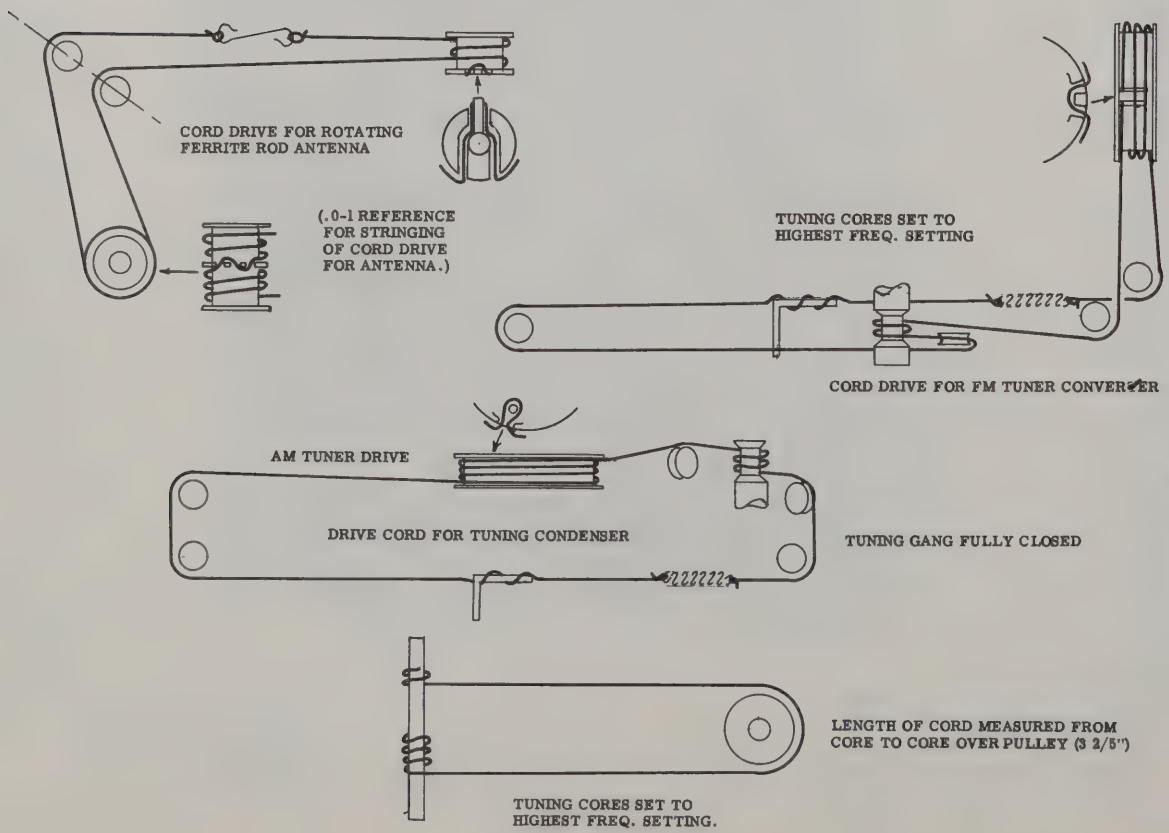
CHASSIS TOP VIEW - ALIGNMENT IDENTIFICATION



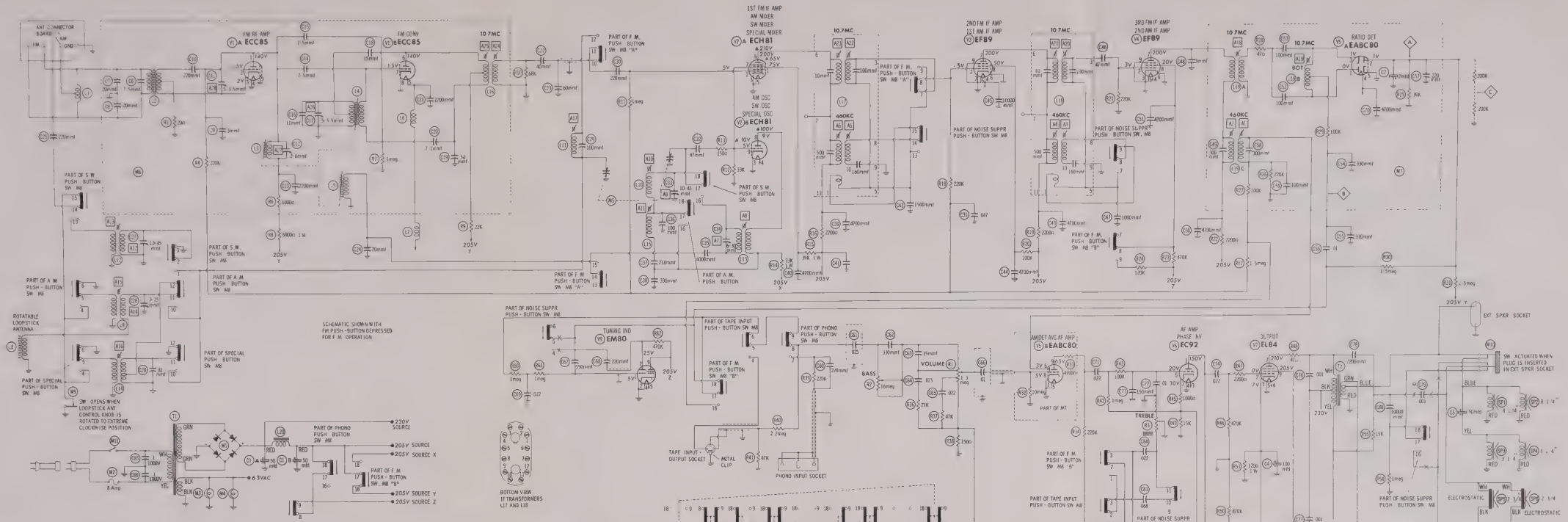
CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS–SUB ASSEMBLY


CORD DRIVE FOR ROTATING FERRITE ROD ANTENNA
(.0-1 REFERENCE FOR STRINGING OF CORD DRIVE FOR ANTENNA.)
TUNING CORES SET TO HIGHEST FREQ. SETTING
CORD DRIVE FOR FM TUNER CONVERTER
AM TUNER DRIVE
DRIVE CORD FOR TUNING CONDENSER
TUNING GANG FULLY CLOSED
LENGTH OF CORD MEASURED FROM CORE TO CORE OVER PULLEY (3 2/5")
TUNING CORES SET TO HIGHEST FREQ. SETTING.

DIAL CORD STRINGING



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	†6200Ω	2Meg	20Ω	0Ω	2Ω	†22K	1Meg	0Ω	0Ω
V2	EC-H81	†39K	2.7Meg	0Ω	2Ω	0Ω	†2700Ω	39K	INF. + 33K	33K
V3	EF89	NC	2Meg	0Ω	2Ω	0Ω	0Ω	†2700Ω	†100K	0Ω
V4	EF89	NC	220K	0Ω	2Ω	0Ω	0Ω	†2700Ω	†470K	0Ω
V5	EABC80	1MF	39K	1MF	2Ω	0Ω	220K	0Ω	10Meg	†234K
V6	EC92	†25K	NC	2Ω	0Ω	NC	1.1Meg	16K		
V7	EL84	NC	470K	120Ω	2Ω	0Ω	NC	†440Ω	NC	†540Ω
V8	EL84	NC	470K	120Ω	2Ω	0Ω	NC	†440Ω	NC	†540Ω
V9	EM80	2.8Meg	0Ω	NC	0Ω	2Ω	NC	†470K	NC	†540Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
^ MEASURED IN "AM" POSITION
† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerances on component values make it possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM, SW & SPECIAL BAND ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 2 (grid) of EF89 (V4). Low side to chassis.	460KC (400~ Mod)	AM	800KC	Across voice coil.	A1, A2	With "Noise Suppressor" button down, adjust for maximum output.
2.	"	High side to pin 2 (grid) of ECH81 (V2). Low side to chassis.	"	"	"	"	A3, A4 A5, A6	"
3.	"	"	17.8MC	SW Logging point in "start" position.	17.8MC	"	A7	Adjust for maximum output.
4.	"	"	7.2MC	"	7.2MC	"	A8	Adjust for maximum output. Repeat step 3.
5.	"	"	1450KC	AM	1450KC	"	A9	Adjust for maximum output.
6.	"	"	600KC	"	600KC	"	A10	Adjust for maximum output. Repeat step 5.
7.	"	"	200KC	Special	200KC	"	A11	Adjust for maximum output.
	Set antenna control knob to "O" position so that receiver will be on external antenna.							
8.	200MMF & 100Ω carbon resistor in series	High side thru dummy to AM antenna socket. Low side to chassis.	17.8MC	SW	17.8MC	"	A12	"
9.	"	"	7.2MC	"	7.2MC	"	A13	Adjust for maximum output. Repeat step 8.
10.	"	"	1450KC	AM	1450KC	"	A14	Adjust for maximum output.
11.	"	"	600KC	"	600KC	"	A15	Adjust for maximum output. Repeat step 10.
12.	"	"	200KC	Special	200KC	"	A16	Adjust for maximum output.
13.	"	"	460KC	AM	800KC	"	A17	"

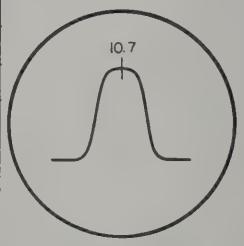

FIG. 1

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
14.	500MMF	High side to pin 2 (grid) of EF89 (V4). Low side to chassis.	10.7MC (unmod)	FM	Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A18	Adjust for maximum deflection.
15.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
16.	"	High side to pin 2 (grid) of ECH81 (V2). Low side to chassis.	"	"	"	DC probe to point Ⓐ. Common to chassis.	A20, A21, A22, A23	Adjust for maximum deflection.
17.	Direct	High side to ungrounded tube shield floating over ECC85 (V1). Low side to chassis.	"	"	"	"	A24, A25	"

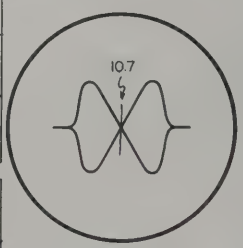

FIG. 2

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
14.	500MMF	High side to pin 2 (grid) of EF89 (V4). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A18	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
15.	"	"	"	"	"	Vert. amp. to point Ⓑ. Low side to point Ⓒ.	A19	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of crossover lines.
16.	"	High side to pin 2 (grid) of ECH81 (V2). Low side to chassis.	"	"	"	Vert. amp. to point Ⓐ. Low side to chassis.	A20, A21, A22, A23	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
17.	Direct	High side to ungrounded tube shield on ECC85 (V1). Low side to chassis.	"	"	"	"	A24, A25	"

FM RF ALIGNMENT

A28 (neutralizing adjustment) has been preset by manufacturer and should not be tampered with.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
18.	Direct	Across FM antenna terminals.	100MC	FM	100MC	DC probe to point Ⓐ. Common to chassis.	A26	Adjust for maximum deflection.
19.	"	"	91MC	"	91MC	"	A27	"

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp.-FM Conv.	ECC85	*
V2	1st. FM IF Amp.-AM Mixer - Osc.	ECH81	
V3	2nd. FM - 1st. AM IF Amp.	EF89	
V4	3rd. FM - 2nd. AM IF Amp.	EF89	
V5	Ratio Det.-AM Det.-AVC-AF Amp.	EABC80	
V6	Phase Inverter	EC92	
V7	Output	EL84	
V8	Output	EL84	
V9	Tuning Indicator	EM80	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	TELEFUNKEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	350	8265351	PRS350V40		FP137			
B	50	350		40		TC79			
C2	2	30			BBR2-50	TAP100-2	ML-2-50		R2308 *
C3	2	350	8234069	PRS350V4	BR245	TC60	TD-4-350		TVA-1601
C4	100	15	8234038	PRS15V100	BBR100-15	TC2501	TD-100-15	MTH-1510	TVA-1160
C5	50	4	8234080	SRE6V50	BBR50-6	TC29	TD-50-6	MMT-650	TVA-1100

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	Telefunken PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	7.5									
C7	20									
C8	20									
C9	3									
C10	220									
C11	.5-3.5									
C12	2-6									
C13	2200									
C14	7.5									
C15	7.5									
C16	11									
C17	.5-3.5									
C18	15									
C19	50									
C20	7.1									
C21	2200									
C22	40									
C23	60									
C24	20			NP0-SI20	TCZ-20	TZ13	NP0K-200	ZT-542	5TCC-Q2	
C25	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C26	3-15									
C27	10-45									
C28	81									
C29	100			NP0-SI100	TCZ-100	TZ30	NP0-337-101	ZT-531	5TCC-T1	
C30	220			NP0-SI220	TCZ-220		NP0-335-221		5TCC-T22	
C31	.047	250		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C32	47			NP0-SI47	TCZ-47	TZ22	NP0-338-470	ZT-5447	5TCC-Q47	
C33	10-45									
C34	6-30									
C35	4000									
C36	100			NP0-SI100	TCZ-100	TZ30	NP0-337-101	ZT-531	5TCC-T1	
C37	218									
C38	330			1469-00033	D6-331	5R5T33	811-331		MS-333	
C39	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C40	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C41	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C42	1500			DI-0015	DD-152	G071	811-152	UC-5215	5HK-D15	
C43	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C44	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C45	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C46	47			NP0-SI47	TCZ-47	TZ22	NP0-338-470	ZT-5447	5TCC-Q47	
C47	1000			DI-001	DD-102	G069	811-102	UC-521	5GA-D1	
C48	3			NP0-DI3		Z007	NP0A-030	ZT-553		
C49	300				TCZ-300	TZ41	NP0-335-301			

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	Telefunken PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C50	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C51	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C52	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C53	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C54	330			1469-00033	D6-331	5R5T33	811-331		MS-333	
C55	330			1469-00033	D6-331	5R5T33	811-331		MS-333	
C56	.01	250		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C57	220			DI-00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C58	300				TCZ-300	TZ41	NP0-335-301			
C59	100			BPD-0001	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C60	220			DI-00022	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C61	.025	250								
C62	330			SI300	D6-301	TP42	GP2K-301	UC-533	5GA-T3	
C63	15			SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	
C64	.015	250		BPD-015	DD16-153	CUB6S15	821-015	PT6115	4TM-S15	
C65	.022	125		BPD-02	DF-203	CUB4S22	817-02	PT4122	2TM-S22	
C66	.01	250								
C67	150			SI150	D6-151	TP36	GP2K-151	UC-5315	5GA-T15	
C68	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C69	.022	125		BPD-02	DF-203	CUB4S22	817-02	PT4122	2TM-S22	
C70	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C71	.022	500		BPD-02	DF-203	CUB6S22	817-02	PT6122	6TM-S22	
C72	.01	250		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C73	150			SI150	D6-151	TP36	GP2K-151	UC-5315	5GA-T15	
C74	.022	500		BPD-02	DF-203	CUB6S22	817-02	PT6122	6TM-S22	
C75	.022	250		BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C76	.001	500		BPD-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C77	.001	500		BPD-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C78	2200	500		1464-0022		1R5D22			MS-222	
C79	.001	1000		P1088N-001	DD-102	CUB16D1	1R5KV-102	PT1621	10TM-D1	Note 1
C80	10000	500								
C81	.22	125		P288N-22		CUB2P22		PT4022	2TM-P22	
C82	2200			1464-0022		1R5D22			MS-222	
C83	.068	125		P288N-068		CUB4S68			4TM-S68	
C84	.022	125		BPD-02	DF-203	CUB4S22	817-02	PT4122	2TM-S22	
C85	.1	1000								
C86	.1	1000								

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Telefunken PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1.3Meg	½	8245201					Volume
R2	16Meg	½	8245113					Bass
R3	500K	½	8245114					Treble

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Telefunken PART No.	IRC PART No.	NOTES
R4	220K			BTS-220K	
R5	20Ω 5%			BW½-20 5%	
R6	1000Ω			BTS-1000	
R7	1Meg			BTS-1Meg	
R8	6800Ω	1		BTA-6800	
R9	22K			BTS-22K	
R10	68K			BTS-68K	
R11	1Meg			BTS-1Meg	
R12	33K			BTS-33K	
R13	150Ω			BTS-150	
R14	33K	1		BTA-33K	
R15	39K	1		BTA-39K	
R16	2200Ω			BTS-2200	
R17	1.5Meg			BTS-1.5Meg	
R18	220K			BTS-220K	
R19	2200Ω			BTS-2200	
R20	100K			BTS-100K	

ITEM No.	RATING OHMS	RATING WATT	Telefunken PART No.	IRC PART No.	NOTES
R21	220K			BTS-220K	
R22	2200Ω			BTS-2200	
R23	470K			BTS-470K	
R24	120K			BTS-120K	
R25	39K			BTS-39K	
R26	220K			BTS-220K	
R27	100K			BTS-100K	
R28	47Ω			BTS-47	
R29	100K			BTS-100K	
R30	1.5Meg			BTS-1.5Meg	
R31	1.5Meg			BTS-1.5Meg	
R32	10Meg			BTS-10Meg	
R33	4700Ω			BTS-4700	
R34	220K			BTS-220K	
R35	10K			BTS-10K	
R36	27K			BTS-27K	
R37	47K			BTS-47K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Telefunken PART No.	IRC PART No.	
R38	150Ω			BTS-150	
R39	220K			BTS-220K	
R40	2.2Meg			BTS-2.2Meg	
R41	47K			BTS-47K	
R42	1Meg			BTS-1Meg	
R43	100K			BTS-100K	
R44	15K			BTS-15K	
R45	1000Ω			BTS-1000	
R46	470K			BTS-470K	
R47	2200Ω			BTS-2200	
R48	47Ω			BTS-47	
R49	15K			BTS-15K	
R50	470K			BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Telefunken PART No.	IRC PART No.	
R51	2200Ω			BTS-2200	
R52	47Ω			BTS-47	
R53	120Ω	1		BTA-120	
R54	1Meg			BTS-1Meg	
R55	15K			BTS-15K	
R56	33K			BTS-33K	
R57	2200Ω			BTS-2200	
R58	2200Ω			BTS-2200	
R59	330Ω			BTS-330	
R60	1Meg			BTS-1Meg	
R61	1Meg			BTS-1Meg	
R62	470K			BTS-470K	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Telefunken PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.63A	210VAC @.095A	6.3VAC @4.1A		9037183					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Telefunken PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9700Ω	1.8Ω	9037181						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Telefunken PART No.	QUAM PART No.	RCA TYPE No.	
SP1	8 1/4"	PM	5.1Ω	9044657			① Electrostatic speakers
SP2	8 1/4"	PM	5.1Ω	9044657			
SP3	3 1/4"	PM	5.5Ω	8213077	3A15TZ5.5		
SP4	3 1/4	PM	5.5Ω	8213077	3A15TZ5.5		
SP5	2 3/4"			8213052 ①			
SP6	2 3/4"			8213052 ①			

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Telefunken PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	.2ΩCT		9037049				
L2	FM Ant. Coil	.2Ω	0ΩCT					
L3	FM RF Coil	0Ω						
L4	FM Osc. Coil	0Ω	0Ω					
L5	IF Trap	0Ω						
L6	Fil. Choke	0Ω						
L7	Fil. Choke	0Ω		9036638				
L8	BC Loop Stick	.9Ω		9037103				
L9	BC RF Coil	40Ω	.8Ω	9037102				
L10	BC Osc. Coil	1.6Ω		9036223				
L11	IF Trap	10Ω		9037077				
L12	SW RF Coil	.4Ω	0Ω	9036219				
L13	SW Osc. Coil	.4Ω	0Ω	7035805				
L14	Long Wave RF Coil	48Ω	145Ω ■	9036699				■ Tapped @ 6Ω
L15	Long Wave Osc. Coil	7Ω		7035807				
L16	1st. FM IF	1Ω	1Ω CT					
L17A	2nd. FM IF	.9Ω	.6Ω					
B	1st. BC IF	3.3Ω	6.5Ω	9045280				Tertiary winding -. 9Ω
L18 A	3rd. FM IF	.9Ω	.6Ω					
B	2nd. BC IF	3.3Ω	6.5Ω	9045280				Tertiary winding -. 9Ω
L19A	Ratio Det. Trans.	2.2Ω	.3Ω					
B	Ratio Det. Coil	4ΩCT						
C	3rd. BC IF	4.2Ω	4.2Ω					

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	Telefunken PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L20	.036A	540Ω	10.8 HY	9036832	C5004 ①	C-2981 ①	C-1215 ①	20C66 ①	C-3X ①

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Telefunken PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.095A	8246067		60-9150 ①				① Two required

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Telefunken PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2		.8A 250V	8248284	7041261				

MISCELLANEOUS

ITEM No.	PART NAME	Telefunken PART No.	NOTES
M3	Dial Light	8247002	Screw type (7V @.3A)
M4	Dial Light	8247002	Screw type (7V @ .3A)
M5	Tuning Cap.	8236019	2 Gang (12-570, 15-505MMF)
M6	FM Tuner - Converter Unit	9049452	Less V1. Includes coils, capacitors and resistors
M7	Ratio Det.-AM Det.-AVC-AF Amp. Unit	9049358	Less V5. Includes coils, capacitors and resistors
M8	Switch Assy.	9045530	Selector (Pushbutton, slide type) Includes L10, L11, L13, L14, L15, L16
M9	Switch		Ext. Ant. (On-off)
M10	Switch	9045536	Speaker. Includes external loudspeaker socket
M11	Switch	8265952	Power (on-off)
	Cabinet	8700030	
	Knob	8213056	AM tuning and volume
	Knob	8213057	FM tuning, SW-log and inside antenna rotary
	Pushbutton	6824854	8 used
	Tone Control Indicator	9045298	
	Ant. Direction Indicator	9045299	
	Dial	8213759	
	Dial Pointer	9025787	For special AM & SW ranges
	Dial Pointer	9025788	For FM range

PHOTOFACT* Folder

*TRADE MARK

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ZENITH MODEL Z2229R

TRADE NAME	Zenith	MODELS	CHASSIS
		Z2229R, RU, Z2230E, EU, R, RU, Z2255E, EU, R, RU, Z2257E, EU, M, MU, R, RU	19Z22, U
		Z3010E, EU, H, HU, R, RU, Y, YU	19Z22Q, QU
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois		
TYPE SET	Television Receiver		
TUBES	Nineteen		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 1.52 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from front panel of cabinet.

2. Remove 4 metal screws. Remove rear cover.

3. Disconnect speaker leads and tuner leads.

4. Remove 2 metal screws from rear of cabinet (holding tuner to cabinet). Lower rear of tuner and pull out.

5. Remove retaining nut from front of cabinet. Remove on/off volume control assembly.

6. Remove 4 chassis bolts. Remove chassis.

7. Remove 4 speaker nuts. Remove speaker.

MODEL	CHASSIS
Z2229R	19Z22

ZENITH MODELS Z2229R, RU, Z2230E, EU, R, RU, Z2255E, EU, R, RU, Z2257E, EU, M, MU, R, RU, Z3010E, EU, H, HU, R, RU, Y, YU (Ch. 19Z22, Q)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the VHF tuner oscillator circuit, it is necessary to remove rear cover and supply power to set. Adjustments are made thru the hole marked "Bull's Eye Adjustment" and are accessible one at a time as the selector switch is turned to each channel. (Fine tuning control must be set to the center of its range before making adjustments). Use Zenith alignment wrench part #62-21 for adjustment.

PICTURE TUBE SAFETY GLASS CLEANING

Turn Zenith emblem located at top escutcheon plate counter clockwise 1/4 turn, push up top escutcheon plate and remove. Safety glass may now be removed. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENTS

A. AGC Control Adjustment

Turn the set on and tune in a TV signal and observe the picture. Starting from the clockwise position, turn the AGC control slowly counter clockwise until picture distorts and buzz is heard in the sound. Then turn control clockwise for clearest picture and best sound.

B. Fringe Lock Adjustment

Turn the fringe lock control 1/4 turn from full clockwise position. Adjust the vertical and horizontal hold for picture synchronization and check stability by switching off channel and back again. SLIGHTLY retouch the fringe lock control adjustment, if necessary, for maximum stability while testing as above.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator may be made from the front of the receiver. Adjust the horizontal hold (L13) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control located on the rear apron of the receiver for maximum volume and minimum buzz. If results are unsatisfactory, refer to the alignment instructions.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

ANTI-PIN CUSHION ADJUSTMENT

Reduce the picture size so that the sides of the raster are visible, and position the magnets so that all sides are straight lines and the corners are at right angles.

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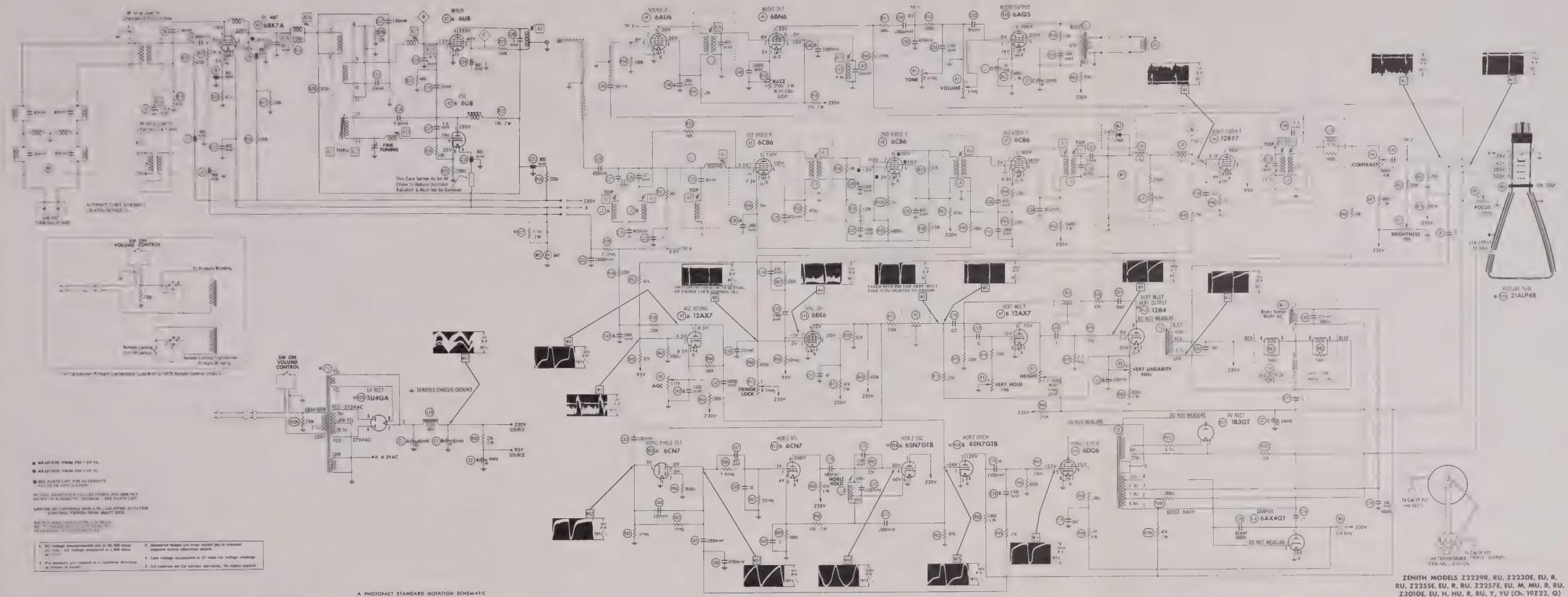
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A PHOTOFACT STANDARD NOTATION SCHEMATIC
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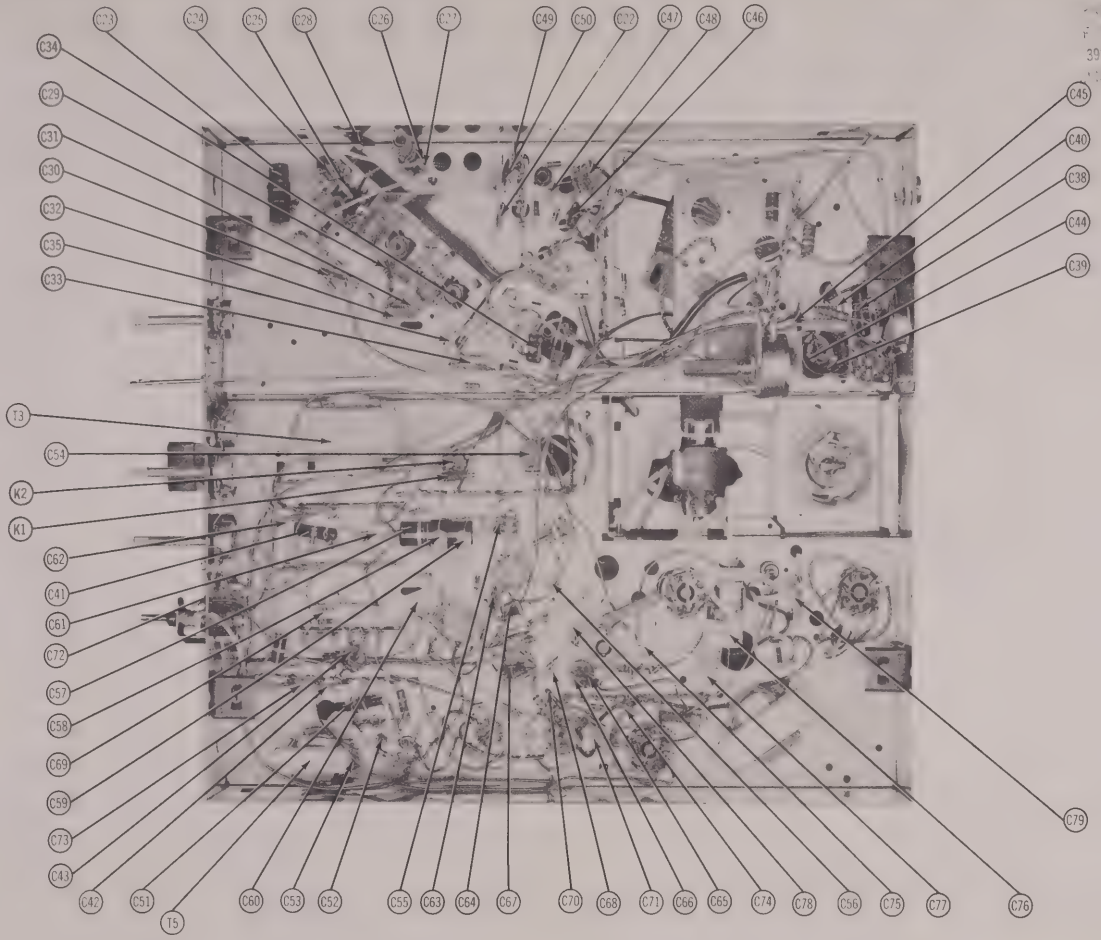
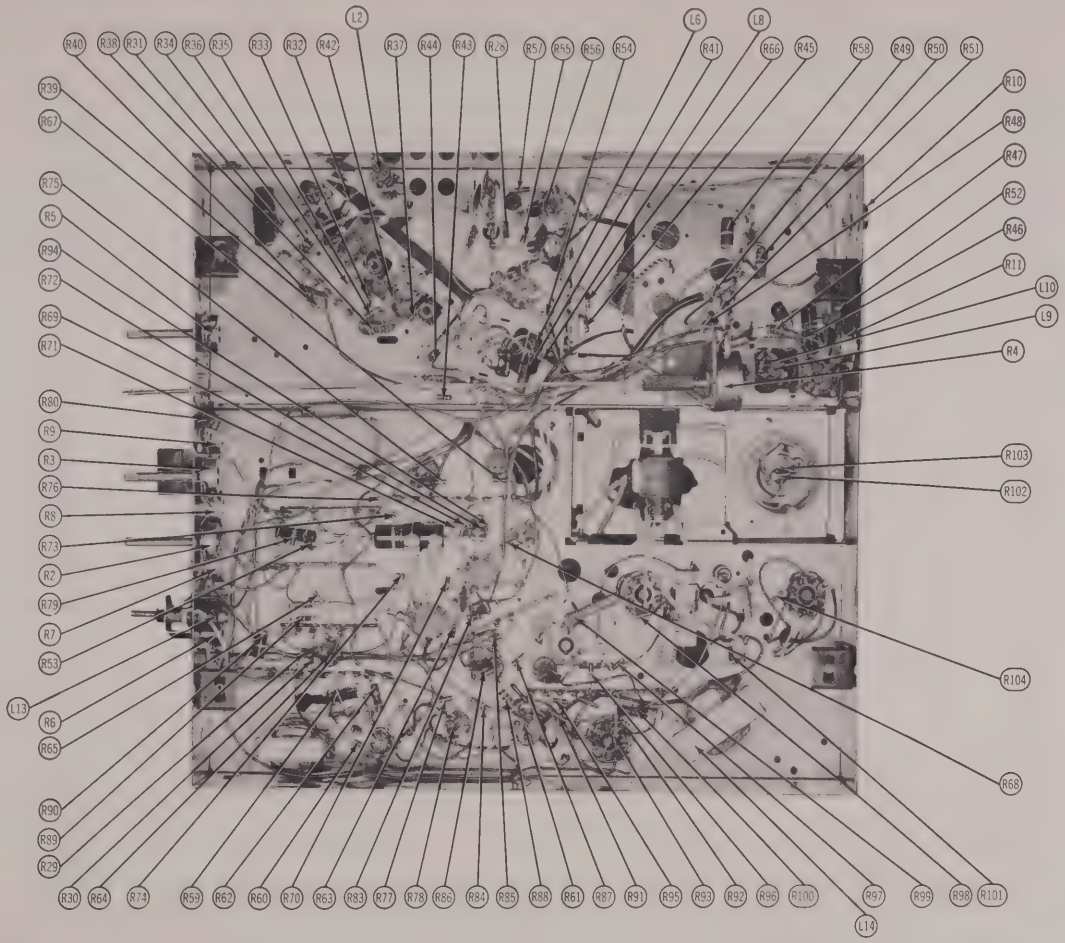


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ZENITH MODELS Z2229R, RU, Z2230E, EU, R, RU, Z2235E, EU, R, RU, Z2357E, EU, M, MU, R, RU, Z2010E, EU, H, HU, K, RU, Y, YU (Ch. 19232, Q).



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART

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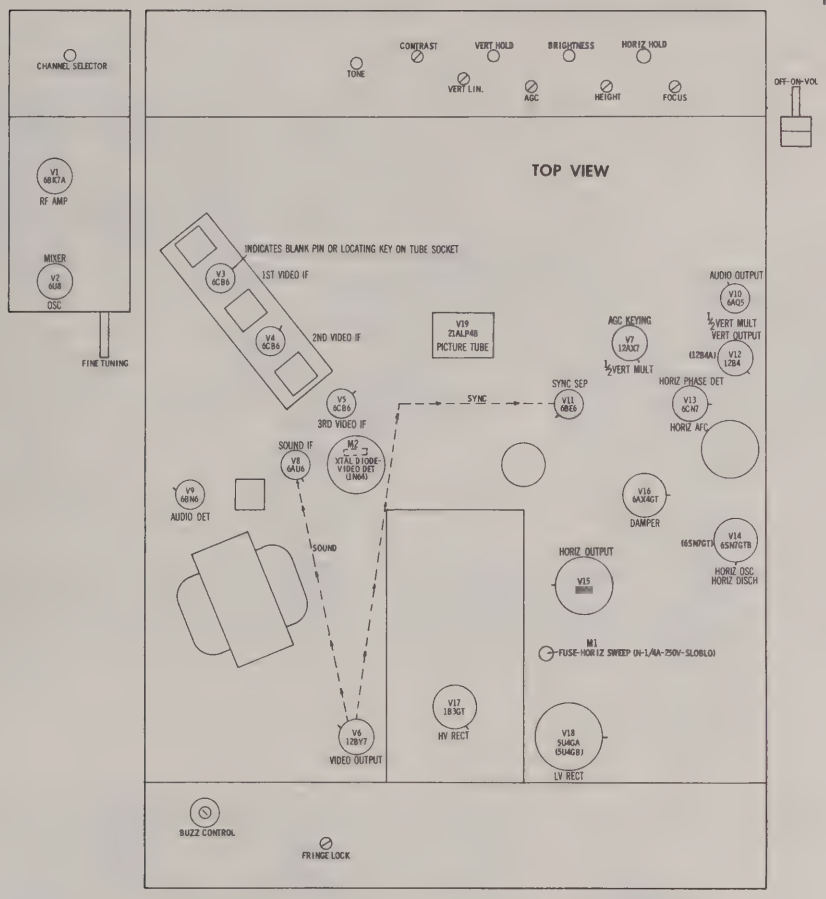


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V18

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V7, V19
Has pic, no sound - V8, V9, V10
Overloaded picture - V7

SYNC FAILURE
No vert. sync - V7, V11, V12
No horiz. sync - V11, V13, V14
No vert. or horiz. sync - V11

SWEEP FAILURE
No raster, has sound - V14, V15, V16, V17, V19, Fuse (M1)
No vertical deflection - V7, V12
Poor vert. linearity or foldover - V7, V12
Poor horiz. linearity or foldover - V14, V15, V16
Narrow picture - V14, V15, V16, V17, V18
Vert. off freq. - V7, V11, V12
Horiz. off freq. - V11, V13, V14

ZENITH MODELS Z2229R, RU, Z2230E, EU, R, RU, Z2255E, EU, R, RU, Z2257E, EU, M, MU, R, RU, Z3010E, EU, H, HU, R, RU, Y, YU (Ch. 19Z22, Q)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS - READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If the set is to be aligned with the picture tube removed, the high voltage lead should be securely taped away from the chassis.

VHF II ALIGNMENT

Place the tuner barrel mid-way between two channels.
Connect the negative lead of a 2 volt bias supply to the ungrounded side of C23. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MM	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis.	44MC (10MC Swp)	39.75MC 45.75MC	See note above.	Vert. amp. thru 10K to point (A). Low side to chassis.	A1, A2	Adjust for response curve similar to Fig. 1. If correct response cannot be obtained, check to see that the slugs are entering the coils from the outside ends of the coil forms.
2.		High side to point (A). Low side to chassis		39.75MC 41.25MC 47.25MC	"	"	A3, A4, A5	Reduce bias to zero. Turn sweep generator output to maximum. Increase gain on scope to magnify trap portions of response curve. Adjust traps for response similar to Fig. 2.
3.				42.75MC 45.0MC 45.75MC			A6, A7, A8, A9	Replace 2 volt bias. Adjust for response curve similar to Fig. 3. Readjustment of A1 and A2 should not be required to obtain proper response.

FIG. 1

FIG. 2

FIG 3

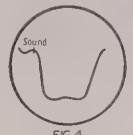


FIG. 4

FIG. 5

FIG. 6

VHF OSCILLATOR ALIGNMENT

The master oscillator adjustment A10 is made only if the individual oscillator adjustments fail to bring all channels within the range of the fine tuning control. If channels 2 through 6 fall within the fine tuning range but the high channels do not, slight adjustment of A10 may bring the high channels in. This is accomplished by compressing or expanding coil turns.
Ground the AGC lead from the tuner (yellow wire) to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 130Ω carbon resistors	Across antenna terminals with 130Ω in each lead.	57MC (20MC Swp)	59.75MC 65.75MC	2 3	Vert. amp. thru 10K to point (A). Low side to chassis.	A11 A12	Adjust to place sound marker in trap notch as in Fig. 4.
			63MC (10MC Swp)					
			69MC (10MC Swp)	71.75MC	4		A13	
			75MC (10MC Swp)	81.75MC	5		A14	
			81MC (10MC Swp)	87.75MC	6		A15	
			177MC (20MC Swp)	179.75MC	7		A16	
			183MC (20MC Swp)	185.75MC	8		A17	
			189MC (10MC Swp)	191.75MC	9		A18	
			195MC (10MC Swp)	197.75MC	10		A19	
			201MC (20MC Swp)	203.75MC	11		A20	
			207MC (20MC Swp)	209.75MC	12		A21	
			213MC (10MC Swp)	215.75MC	13		A22	

VHF RF AND MIXER ALIGNMENT

Ground the AGC lead (yellow wire) from the tuner to chassis

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω carbon resistors	Across antenna terminals with 130Ω in each lead.	69MC (10MC Swp)	67.25MC 71.75MC	4	Vert. amp to point (A). Low side to chassis.	A23, A24, A25	Adjust for response curve similar to Fig. 5.
6.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	"	"	A26, A27	Adjust for response curve similar to Fig. 5. If bandpass is not correct, SLIGHTLY bend L4 (slotted tab in shield plate). Repeat steps 5 and 6 for optimum results on all channels.

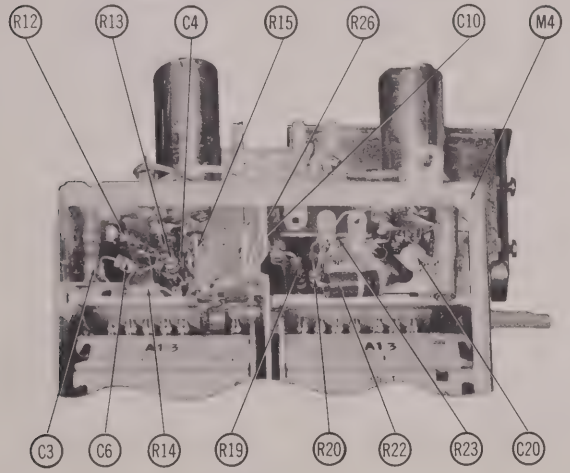
UHF TUNER ALIGNMENT

Any attempt to peak any one particular channel will usually cause serious degradation of the other channels. No attempt should be made to adjust the oscillator unless the calibration is off more than three channels. Turn the UHF tuning dial to channel 54. The rotary arm of the tuner should be horizontal. If it is not, loosen the set screw on the drive pulley and turn the tuner shaft independently of the pulley until the rocker arm is horizontal with the channel indicator at channel 54. Tighten the set screw.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

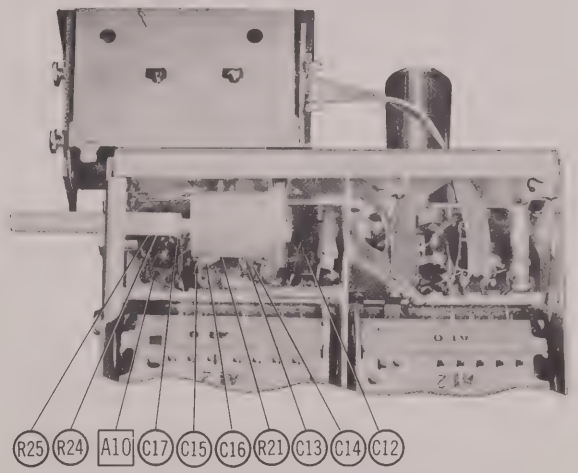
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon resistors	Across UHF antenna terminals with 120Ω in each lead.	715MC (10MC Swp)	710.25MC	84	Vert. amp thru 10K to point (A). Low side to chassis.	A28, A29 A30	Adjust for response curve similar to Fig. 6. When adjusting A28, two responses may be found. The correct setting is with the adjustment at the most counter clockwise position.
8.	"	"	473MC (10MC Swp)	471.25MC	14	"		Check for response similar to Fig. 6. If the oscillator is off calibration more than 3 channels, adjust the oscillator travel adjustment (osc., mixer and antenna travel adjustments are the round thumb screws on top of the tuner) to scale. Care must be exercised when making this adjustment not to move the rocker arm out of its bearing. Adjust the mixer and antenna travel adjustmeats for maximum amplitude response
9.	"	"	887MC (10MC Swp)	885.25MC	83	"	A31, A32, A33	Adjust A31 to place marker at 50% as in Fig. 6. Adjust A32 and A33 for maximum amplitude of response

SOUND IF ALIGNMENT

Connect an attenuator (Zenith part no. S-17303 or equivalent) in series with the receiver antenna. Tune in a TV station and adjust the attenuator until the signal falls below the limiting level of the 6BN6 audio detector, as evidenced by hiss similar to super-regeneration. Adjust the sound take-off transformer (A34 and A35), the sound IF coil (A36) and the quadrature coil (A37) for maximum sound and best quality. Adjust the buzz control (R10) for minimum buzz. If the buzz cannot be eliminated with the buzz control, check the setting of the AGC control. If during any of the sound IF adjustments the signal rises above the limiting level (hiss disappears), increase the attenuation until the hiss returns.



RF TUNER LEFT SIDE

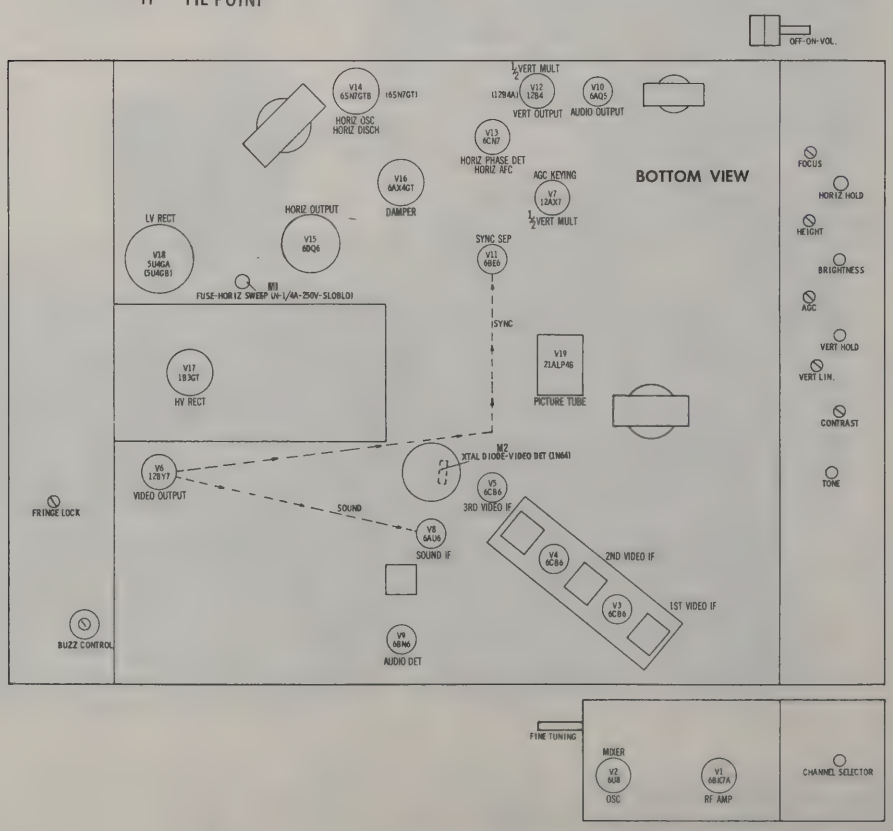


RF TUNER RIGHT SIDE

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BK7A	†700Ω	60K	INF	0Ω	.1Ω	INF	3Meg	47Ω	0Ω
V2	6U8	†10K	68K	†100K	.1Ω	0Ω	†250Ω	0Ω	2200Ω	†12.2K
V3	6CB6	1.2Meg	450Ω	.1Ω	0Ω	▲ 470Ω	▲ 470Ω	0Ω		
V4	6CB6	▲ 6800Ω	▲ 15Ω	.1Ω	0Ω	†500Ω	†500Ω	60K		
V5	6CB6	220Ω	340Ω	.1Ω	0Ω	†5600Ω	†5600Ω	0Ω		
V6	12BY7	15Ω	2700Ω	15Ω	0Ω	0Ω	.1Ω	†5600Ω	†16K	15Ω
V7	12AX7	700K	3300Ω	● 7000Ω	.1Ω	.1Ω	● *4Meg	● 3.5Meg	0Ω	0Ω
V8	6AU6	100K	0Ω	.1Ω	0Ω	†30K	†30K	0Ω		
V9	6BN6	● 90Ω	.4Ω	.1Ω	0Ω	†22K	4.6Ω	*1.2Meg		
V10	6AQ5	● 500K	680Ω	0Ω	.1Ω	†1250Ω	†535Ω	● 500K		
V11	6BE6	17K	0Ω	.1Ω	0Ω	†60K	†47K	10Meg		
V12	12B4	● 1100Ω	2.2Meg	.1Ω	0Ω	0Ω	NC	2.2Meg	NC	†485Ω
V13	6CN7	3900Ω	2Meg	1Meg	.1Ω	0Ω	560Ω	4Meg	47K	.1Ω
V14	6SN7GTB	47K	*230K	0Ω	32K	†65Ω	10K	0Ω	.1Ω	
V15	6DQ6	NC	.1Ω	TP	†10K	470K	TP	0Ω	0Ω	TOP CAP *11Ω
V16	6AX4GT	NC	NC	200K	NC	†70Ω	NC	0Ω	.1Ω	
V17	1B3GT	PINS 1 - 8 HAVE INFINITE RESISTANCE								TOP CAP *280Ω
V18	5U4GA	NC	20K	TP	29Ω	NC	26Ω	TP	20K	
V19	21ALP4B	0Ω	†80K	Pin 6 ● *50K	Pin 10 *47K	Pin 11 ● †240K	Pin 12 .1Ω			

▲ MEASURED FROM PIN 7 OF V4.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 2 OF V18.
* MEASURED FROM PIN 3 OF V16.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART

CHASSIS TOP VIEW

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amp.	6BK7A	
V2	Mixer Osc.	6U8	
V3	1st Video-IF Amp.	6CB6	
V4	2nd Video-IF Amp.	6CB6	
V5	3rd Video-IF Amp.	6CB6	
V6	Video Output	2BY7	
V7	AGC Keying - Vert. Mult.	12AX7	
V8	Sound-IF Amp.	6AU6	
V9	Audio Det.	6BN6	

ITEM No.	USE	TYPE	NOTES
V10	Audio Output	6AQ5	
V11	Sync Sep.	6BE6	
V12	Vert. Mult. - Vert. Output	12B4	Note 1
V13	Horiz. Phase Det. - Horiz. AFC	6CN7	
V14	Horiz Osc. - Horiz. Disch	6SN7GTB	Note 2
V15	Horiz. Output	6DQ6	
V16	Damper	6AX4GT	
V17	HV Rectifier	1B3GT	
V18	1.V Rectifier	5U4GA	Note 3

Note 1: 12B4A used in some versions.
Note 2: 6SN7GT used in some versions.
Note 3: 5U4GB used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	ZENITH PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V19	21AUP4B	21AUP4B	21AUP4B	21AUP4A ②	① Aluminized ② Silver Screen "85"
		21AUP4A ①	21AUP4A ①		
		21ALP4			
	21BAP4				

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							
	CAP	VOLT	ZENITH PART No.	ASEVOVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C1A	40	400	23-2547	AFH3-93-45	CG370	FP385.5	TMT-45	TP-385	TVL-4069	
B	40	400			DR370	TC45	TMT-45	MT-4540		
C	10	450								
D	20	25								
C2A	4	350	23-2546	AFH3-189-40	CI444	FP384.2			TVL-3905.6	
B	100	50				TC88				
C	10	475								

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	ZENITH PART No.	ASEVOVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	2.5-6		23-2231							
C4	800		23-2331	BPD-0006	DD-801	G087	ED-0006		5GA-75	
C5	800		23-2577							
C6	2.4		23-2298							
C7	800		23-2577							
C8	800		23-2577							
C9	800		23-2577							
C10	65-23		23-2452							
C11	800		23-2331	BPD-0006	DD-801	G087	ED-0006		5GA-75	
C12	120		23-2496	NT80-S230	TCN-130	N044	TCT-130			
C13	19		23-2406							
C14	6-3		23-2299							
C15	1		23-2434	NP0-S13.3	TC2-3R3	2006	TC2-3.3		5TCCB-V33	
C16	5.8									
C17	3.4		23-2592							
C18	800		23-2577							
C19	800		23-2577							
C20	3		23-2585							
C21	800		23-2577							
C22	6000		23-3	BPD-01	DD-103	KD68	ED-01	DC511	5HK-51	
C23	.18	300	23-2147	P388N-18		CUB3P15		GEM-3015	5TMP-P15	
C24	470	300	23-3	BPD-00047	DD-471	KD60	ED-470	UC-5347	5GA-T47	
C25	7		23-2575			Z015				
C26	13		23-2579							
C27	13		23-2579							
C28	470		23-3	BPD-00047	DD-471	KD60	ED-470	UC-5347	5GA-T47	
C29	470		23-3	BPD-00047	DD-471	KD60	ED-470	UC-5347	5GA-T47	
C30A	1000		23-21	BPD-S3001	DDS-103	DK099	EDS-001	DCD531	5HK-3D1	
B	1000									
C31	470		23-16	BPD-00047	DD-471	KD60	ED-470	UC-5347	5GA-T47	
C32	1000		23-17	SD1000	DS-103	TP83	GP-1000	UC-531	5GA-D1	
C33	1000		23-3112	BPD-1000	DS-103	TP83	GP-1000	UC-531	5GA-D1	
C34	470		23-3234	BPD-00047	DD-471	KD60	ED-470	UC-5347	5GA-T47	
C35	470		23-3237	BPD-00047	DD-471	KD60	ED-470	UC-5347	5GA-T47	
C36	13		23-3240							
C37	7		23-3275							
C38	.033	300	23-1798	BPD-03	DF-303	CUB4S33	ED-03	GEM-4123	5TM-S23	
C39	47	300	23-2447	NP0-S247	TC2-47	2033	TC2-33	ZT-5447	5TCC-Q47	
C40	470	300	23-1777	P388M-4	DF-304	CUB3P1		GEM-3041	5TM-P1	
C41	.01	600	23-1946	BPD-01	DS-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C42	10000		23-3	BPD-01	DD-103	KD68	ED-01	DC511	5HK-51	
C42A	6000		23-21	BPD-S2001	DDS-103	DK099	EDS-001	DCD531	5HK-3D1	
B	6000									
C44	3.3		23-2343	NP0-S13.3	TC2-3R3	T206	TC2-3.3	ZT-5533	5TCCB-V33	
C45	50		23-2490	NP0-S50	TC2-50	Z011	TC2-50	ZT-546	5TCC-Q5	
C46A	1000		23-21	BPD-S2001	DDS-103	DK099	EDS-001	DCD531	5HK-3D1	
B	1000									
C47	10		23-2721	NP0-S10	TC2-10	T209	TC2-10	ZT-541	5TCC-Q1	
C48	10000		23-3	BPD-01	DD-103	KD68	ED-01	DC511	5HK-51	
C49	10000		23-3	BPD-01	DD-103	KD68	ED-01	DC511	5HK-51	
C50	470		23-3	BPD-00047	DD-471	KD60	ED-470	UC-5347	5GA-T47	
C51	2200		23-3	BPD-0023	DS-223	KD73	ED-0023	UC-5323	5GA-D23	
C52	39		23-2706	N750-S239	TC2-39	N031	TC2-39			
C53	2200		23-21	BPD-0023	DS-223	KD77	ED-0023	UC-5323	5HK-D23	
C54	470		23-3	BPD-00047	DD-471	KD60	ED-470	UC-5347	5GA-T47	
C55	2200		23-21	BPD-0023	DS-223	KD77	ED-0023	UC-5323	5HK-D23	
C56	27		23-2490	NP0-S235	TC2-27	T216	TC2-27			
C57	.47	300	23-2148	P388N-47		CUB3P47		GEM-3047	5TM-P47	
C58	.033	600	23-2431							
C59	.01	300	23-1585	1494-01		1SHB381			MB-11	
C60	.1	600	23-2005	P488M-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C61	.0047	600	23-1849							
C62	.047	300	23-1795	BPD-05	DF-503	CUB3S47		GEM-3147	5TM-S47	
C63	100		23-9	NP0-D100	DD-101	21RS71	KD-100	MCB335	MB-31	
C64	120	500	23-2606	1498-00018	TC2-120	21RE713	TC2-120		MB-31E	
C65	1500		23-47	1494-0051		1RSD1		MCB355	MB-21	
C66	4700		23-46	1494-0047		1RSD47			MB-247	
C67	470		23-2	BPD-00047	DD-471	KD60	ED-470	UC-5347	5GA-T47	
C68	.01	300	23-1800	BPD-01	DE-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C69	.1	300	23-1777	P388M-1	DF-104	CUB3P1		GEM-301	3TM-P1	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	ZENITH PART No.	ASEVOVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C70	680	500	23-2668	1494-00008	DS-681	1SHB268	ED-680		MB-368	
C71	1500	500	23-2699	DI-0015	DD-152	1WED15	KD-1500	MC3S8	1TM-S15	
C72	1000	500	23-2659	1494-0011		1WED1			MB-31	
C73	1000		23-2598							
C74A	1500		23-3	BPD-2X0015	DD2-152	DK071	ED2-0015	DCD5215	5HK-2D15	
B	1500									
C75	047	400	23-1775	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C76	15	400	23-2241	P488N-15		CUB4P15		GEM-4015	4TM-P15	
C77	1	400	23-2201	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C78	45	4000	23-2658							
C79	150	4000	23-2693							
C80	72	2000								

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA						INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.		
R1A	1Meg		53-3619	B-70-S	A47-1Meg-Z	Q13-137	U53	Volume	
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A	
C	Switch			Not Req.	SWE-12	76-1	U56-56	Attach to R1A	
R2A	200K	½	53-3573	AB-50	A47-200K-S	Q11-139	U43	Brightness	
B	Shaft		Not Req.	Not Req.	ES6-3	Not Req.	Not Req.	Attach to R2A	
R3A	750K	½	53-3599	AB-98	A47-750K-S	Q11-138	U54	Vertical Hold	
B	Shaft		Not Req.	AK-6	ES6-3	Not Req.	M6MDPE	Contrast - Wire-wound	
R4A	5000Ω	½	53-3301	6VP998			M6MDPE	Attach to R4A	
B	Shaft		Not Req.				Not Req.	Not Req.	
R5A	1Meg	½	53-3619	AB-70	A47-1Meg-Z	Q13-137	U53	Tone Control	
B	Shaft		Not Req.	AK-4	ES6-3	Not Req.	Not Req.	Attach to R5A	
R6A	2.5Meg	½	53-361	AB-83	A47-2.5Meg-S	Q11-259	Not Req.	Focus Control - Note 1	
B	Shaft		Not Req.	AK-1	FES-1	RQ	Not Req.	Attach to R6A	
R7A	1.5Meg with 1Meg stop	½	53-3946	4AB-59	4A47-1.5Meg-S	4Q11-143	4U83	Height Control	
B	Shaft		Not Req.	AK-1	FES-1/4	RQ	Not Req.	Attach to R7A	
R8A	15K	½	53-3278	AB-30	A47-15K-S	Q11-119	TA1S3L	AGC Control	
B	Shaft		Not Req.	AK-1	FES-1/4	RQ	Not Req.	Attach to R8A	
R9A	3000Ω	½	53-3288	AB-8	A47-3000-S	Q11-123	PTA3S3L	Vertical Linearity	
B	Shaft		Not Req.	AK-1	FES-1/4	RQ	Not Req.	Attach to R9A	
R10	250Ω with 100Ω stop		53-3384		39-800-S0			Buzz Control - Wire-wound	
R11A	4.5Meg	½	53-3305	AB-97	A47-5Meg-S	Q11-141	6U-67	Fringe Lock	
B	Shaft		Not Req.	AK-1	FES-1/4	RQ	Not Req.	Attach to R11A	

Note 1: Some versions may use alternate control part 49310 (1.5Meg)
* Connect 1.5Meg resistor (1) in series with left hand terminal of the control and the lead connecting to the same terminal of the control. (Control viewed from shaft end, terminals down.)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R12	22K		63-1841	BTS-22K	
R13	470K		63-1897	BTS-470K	
R14	47K		63-1856	BTS-47K	
R15	680		63-1799	BTS-67	
R16	100K		63-1869	BTS-100K	
R17	100K		63-1869	BTS-100K	
R18	330Ω		63-1758	BTS-330	
R19	4700Ω		63-1813	BTS-4700	
R20	470Ω		63-1773	BTS-470	
R21	68K		63-1863	BTS-68K	
R22	33K	2	63-3176	BTS-33K	
R23	100K		63-1869	BTS-100K	
R24	10K		63-1853	BTS-10K	
R25	3300Ω		63-1820	BTS-3300	
R26	22K		63-1841	BTS-22K	
R27	5.6Ω	2			Note 1
R28	2.2Meg		63-1926	BTS-2.2Meg	
R29	330K		63-1884	BTS-330K	
R30	220K		63-1884	BTS-220K	
R31	68Ω		63-1737		
R32	56K		63-1735		
R33	470Ω		63-1773	BTS-470	
R34	68Ω		63-1733	BTS-68	
R35	6800Ω		63-1821		
R36	18K		63-1839		
R37	13K		63-1831		
R38	130K		63-1873	BTS-130K	
R39	330K		63-1873	BTS-330K	
R40	180Ω		63-1764	BTS-180	
R41	6800Ω	5	53-3333	BTS-6800	
R42	470Ω		63-1771	BTS-470	
R43	1500Ω		63-1756	BTS-1500	
R44	150Ω		63-1747	BTS-150	
R45	15K		63-1834	BTS-15K	
R46	15Ω		63-1702	BTS-15	
R47	680Ω	1	63-2290	BTA-680	
R48	33K		63-1843	BTS-33K	
R49	62K		63-1866	BTS-62K	
R50	33K	3	63-1566	BTS-33K	
R51	47K		63-1855	BTS-47K	
R52	330K		63-1884	BTS-330K	
R53	100K		63-1869	BTS-100K	
R54	100K		63-1869	BTS-100K	
R55	10K		63-1853	BTS-10K	
R56	1.5Meg		63-1915	BTS-1.5Meg	
R57	680Ω		63-1779	BTS-680	
R58	33K	3	63-3541	BTS-33K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R59	100Ω		63-1786	BTS-100	
R60	10K		63-1839	BTS-10K	
R61	470Ω		63-1772	BTS-470	
R62	680Ω	1	63-3290	BTA-680	
R63	3300Ω		63-1806	BTS-3300	
R64	680Ω		63-1804	BTS-680K	
R65	180K		63-1880	BTS-180K	
R66	470K		63-1897	BTS-470K	
R67	330K		63-1884	BTS-330K	
R68	10Meg		63-1953	BTS-10Meg	
R69	470K		63-1897	BTS-470K	
R70	82K		63-1866	BTS-82K	
R71	180K		63-1878	BTS-180K	
R72	47K	3	63-1357	BTS-47K	
R73	47K		63-1849	BTS-47K	
R74	330K		63-1864	BTS-330K	
R75	100K		63-1869	BTS-100K	
R76	47K		63-1849	BTS-47K	
R77	2.2Meg		63-1928	BTS-2.2Meg	
R78	220Ω		63-1762	BTS-220	
R79	470K		63-1897	BTS-470K	
R80	820Ω	1	63-3291	BTA-820	
R81	560Ω		63-1775		
R82	560Ω		63-1775		
R83	1Meg		63-1911		
R84	3900Ω		63-1810		
R85	1Meg		63-1911		
R86	5.6Meg		63-1943		
R87	10Meg		63-1953		
R88	1Meg		63-1934		
R89	560Ω		63-1775		
R90	10K	3	63-2455		
R91	22K		63-1842		
R92	47K		63-1855		
R93	180K	1	63-2313		
R94	150K		63-1878		
R95	15K		63-1834		
R96	470K		63-1897		
R97	100Ω		63-1744		
R98	100Ω		63-1744		
R99	10K	4	63-3253		
R100	47K	3	63-3582		
R101	1000Ω		63-1788	BTH-1000	
R102	4.7Ω		63-1981		
R103	22K		63-1842	BTS-22K	
R104	220K		63-3307	BTS-220K	
R105	15Ω		63-1708	BTS-15	

Note 1: Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	ZENITH PART No.	Hallodrson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117VAC	550VCT	5V	6.3V	95-1469	P-9758 ②	P-8834 ③	P-8690 ④	R-81BC ⑤		
		@ 1.52A	@ 2.45A	@ 3A							
				@ 6.5A	95-1497 ①						

① Parallel and phase 6.3V, 6A windings.
② Tape 6.3V, 1.2A winding.
③ Tape 6.3V, 6.5A windings.
④ Fabricate new mounting.
⑤ Tape 6.3V, 1.5A and 5.2V, 1.5A windings.
⑥ Alternate part number.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								NOTES
		ZENITH PART No.	Hallodrson PART No.	Merit PART No.	BCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	Horiz. Output Trans.	8-24978 ①				X25P1	A-8278*		G-82*	
T3	Vert. Output Trans.	95-1454	Z1900 ② ⑤	A-2823 ③ ⑤		V31S ⑤	A-8148 ⑤	26S72 ⑤ ⑥	A-108X ⑤ ⑥	
T4A	Yoke (90°) Horiz (13MH)	95-1443 ④	DF606 ② ⑤	MDF-81 ③ ⑤	25TD1 ⑤	Y60F12/47	DY-13A ⑤	Y-14 ⑤ ⑥	Y-40-1 ⑤ ⑥	
B	Yoke (45MH)		⑤	⑤	⑤	DY-13A ⑤	⑤	⑤	⑤	

① Complete assembly includes: Winding and term. assembly, Zenith part no. S-24901.
Tertiary winding and term. assembly, Zenith part no. S-21564.
② Use 3 to 1 turns ratio.
③ Connect as auto trans.
④ Drill new mounting hole(s).
⑤ Cut and tape blanking winding lead.
⑥ Includes rear cover and centering device. Zenith part no. S-23237; capacitor C80; and resistors R81 and R82.
⑦ Use original rear cover and centering device.
⑧ Use original horiz. yoke damping network with capacitor C80 across terms #3 and #7.
⑨ Connect horiz. yoke term #3 to horiz. output trans. term #3; horiz. yoke terms #3 and #7 to resistor R101; horiz. yoke term #1 to capacitor C77.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

	ORIGINAL (ZENITH) CONNECTIONS	Hallodrson Replacement Connections	Merit Replacement Connections	BCA Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5			1	6		8
	4			2	5		5
	3			3	4		4
	2			4	N.C. See Note ⑩		N.C. See Note ⑩
	1			5	3		3
Special Notes				⑨		⑩	

⑩ To reduce yoke "ringing", connect resistor R101 in series with capacitor C80 across horiz. yoke terms #2 and #1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Hallodrson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	9.4K	3-4Ω	95-1379	Z1900	A-2823	A-3879	24S80	S-51X	

SPEAKER

ITEM No.	RATINGS				REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.		ZENITH PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5 1/4	PM	3-4Ω		49-751 ①	52A1	31T81	① Used in models 2232SR, RU; 2323SR, RU; 2323OE, RU.
	10	PM	3-4Ω		49-752 ②	10A31	23S61	② Used in models 2325SR, RU; 2325SE, EU; 2325TR, RU; 2325TE, EU; 2325TM, MU; 2501OR, RU; 2501OE, EU; 2501OT, YU; 2501ON, HU.
					49-793 ③ ④			③ Used in models 2323OR, RU; 2323OE, EU.
								④ Two used.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	1st Video IF	.1Ω		S-23505				Includes 4i .25MC trap.
L2A	47.25MC Trap	6Ω		S-40235				
B	39.75MC Trap	6Ω						
L3	2nd Video IF	.1Ω	.1Ω	S-17907	17-5004*	TV-125*	6234*	
L4	3rd Video IF	.1Ω	.1Ω	S-19952				
L5	4th Video IF	.3Ω	.3Ω	S-20523				
L6	Series Peaking Coil	5.5Ω		S-17215		TV-102	5177	98 Microhenries
L7	Shunt Peaking Coil	5.5Ω		S-21593		TV-154a	4644a	180 Microhenries; Wound in series on 2700Ω resistor.
L8	Series Peaking Coil	1Ω		S-21592		TV-154a	4645	6.7 Microhenries
L8A	4.5MC Trap	13.5Ω		S-24738				
B	1st Sound IF	1.2Ω						
L10	Series Peaking Coil	5.3Ω		S-21563		TV-154a	5183a	136 Microhenries; Wound on 5600Ω resistor.
L11	2nd Sound IF	.6Ω	.6Ω	S-19962				
L12	Quadrature Coil							
		4.5Ω		S-19030			1480	

*Use adaptor plate.
◆Series with 2700Ω resistor.
▲Parallel with 5600Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA						NOTES
	PRI	SEC	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	BCA TYPE No.	Ram PART No.	Thordarson PART No.	
L13	165Ω		S-19743	19-1577		6324				Type 85Q

ZENITH MODELS Z2232SR, RU; Z2232OE, EU, R, RU; Z2325SE, EU, R, RU; Z2325TE, EU, M, MU, R, RU; Y, YU (Ch. 19222, Q)

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L14	. 245A	65Ω	1. 7HY	95-1376	C5037 ①	C-2996 ①	C-2326 ①	26C44	C-23X

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	Vert. Integrator		87-5	No Replacement
K2	Multivibrator Coupling		87-4	No Replacement

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	1/4A 125V	136-33		333. 250 (N - 1/4A)	346008	N 1/4	HN 0 to 3/10

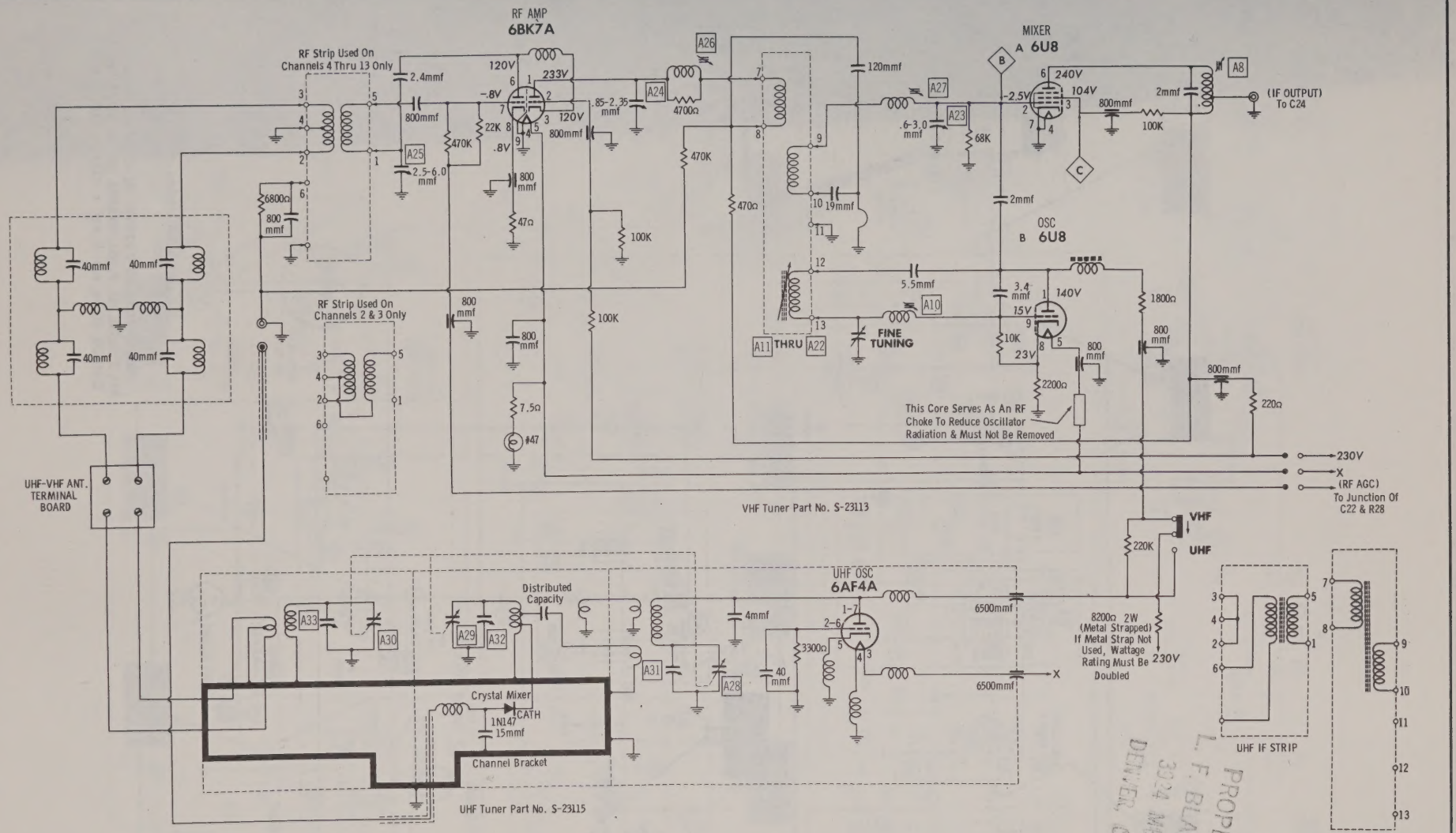
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		ZENITH PART No.	SYLVANIA PART No.	
M2	1N64	103-1	1N60	Video Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Dial Light	100-198	#47
M4	Tuner	S-21735	VHF - Used in models Z2229R, Z2230R, Z2257M, Z2230E, Z2255R, Z2255E, Z2257R, Z2257E
	Tuner	S-24712	VHF - Used in models Z3010R, RU; Z3010E, EU; Z3010H, HU; Z3010Y, YU.
	Tuner	S-23113	VHF - Used in models Z2229RU, Z2230RU, Z2257MU, Z2230EU, Z2255RU, Z2255EU, Z2257RU, Z2257EU.
M5	Tuner	S-23115	UHF - Used in models Z2229RU, Z2230RU, Z2257MU, Z2230EU, Z2255RU, Z2255EU, Z2257RU, Z2257EU.
M6	Trap	S-24644*	VHF Antenna Input Filter
M7	Video Det. Ass'y.	S-21686	Includes M2, L5, L6, L7, C36 and C37.
M8	Centering Device	S-23237	Includes Deflection Yoke (T4) Rear Cover.
M9	Ion Trap	S-22574	
M10	Correction Magnet	S-18763	
M11	Correction Magnet	S-18763	
M12	Width Sleeve	199-175	
	Cabinet	14-1954	Model Z2229R, RU.
	Cabinet	14-1955	Model Z2230R, RU.
	Cabinet	14-1956	Model Z2230E, EU.
	Cabinet	14-2064R	Model Z2255R, RU.
	Cabinet	14-2064E	Model Z2255E, EU.
	Cabinet	14-2060R	Model Z2257R, RU.
	Cabinet	14-2060E	Model Z2257E, EU.
	Cabinet	14-2060M	Model Z2257M, MU.
	Cabinet	14-2055R	Model Z3010R, RU.
	Cabinet	14-2055E	Model Z3010E, EU.
	Cabinet	14-2055H	Model Z3010H, HU.
	Cabinet	14-2055Y	Model Z3010Y, YU.
	Knob	S-24580	Channel Selector - Models Z2229R, RU; Z2230R, RU; Z2255R, RU; Z2257R, RU; Z3010R, RU; Z3010Y, YU.
	Knob	S-40024	Channel Selector - Models Z2230E, EU; Z2255E, EU; Z2257E, EU; Z2257M, MU; Z3010E, EU; Z3010H, HU.
	Knob	S-22408	Fine Tuning
	Knob	46-1541	On-Off-Volume - Models Z2229R, RU; Z2230R, RU; Z2255R, RU; Z2257R, RU; Z3010R, RU; Z3010Y, YU.
	Knob	46-1585	On-Off-Volume - Models Z2230E, EU; Z2255E, EU; Z2257E, EU; Z2257M, MU; Z3010E, EU; Z3010H, HU.
	Knob	46-1117	Horiz. Hold - Models Z2229R, RU; Z2230R, RU; Z2230E, EU.
	Knob	46-1118	Horiz. Hold - Models Z2255R, RU; Z2255E, EU; Z2257R, RU; Z2257E, EU; Z2257M, MU; Z3010R, RU; Z3010E, EU; Z3010H, HU; Z3010Y, YU.
	Knob	46-1181	Vert. Hold, Brightness, Contrast, Tone - Models Z2229R, RU; Z2230R, RU; Z2230E, EU.
	Knob	S-22935	Vert. Hold, Brightness, Contrast, Tone - Models Z2255R, RU; Z2255E, EU; Z2257R, RU; Z2257E, EU; Z2257M, MU; Z3010R, RU; Z3010E, EU; Z3010H, HU; Z3010Y, YU.
	Safety Glass	192-220	Models Z2229R, RU; Z2230R, RU; Z2230E, EU.
	Safety Glass	192-225	Models Z2255R, RU; Z2255E, EU; Z2257R, RU; Z2257E, EU; Z2257M, MU; Z3010R, RU; Z3010E, EU; Z3010H, HU; Z3010Y, YU.

* Alternate part #S-24645



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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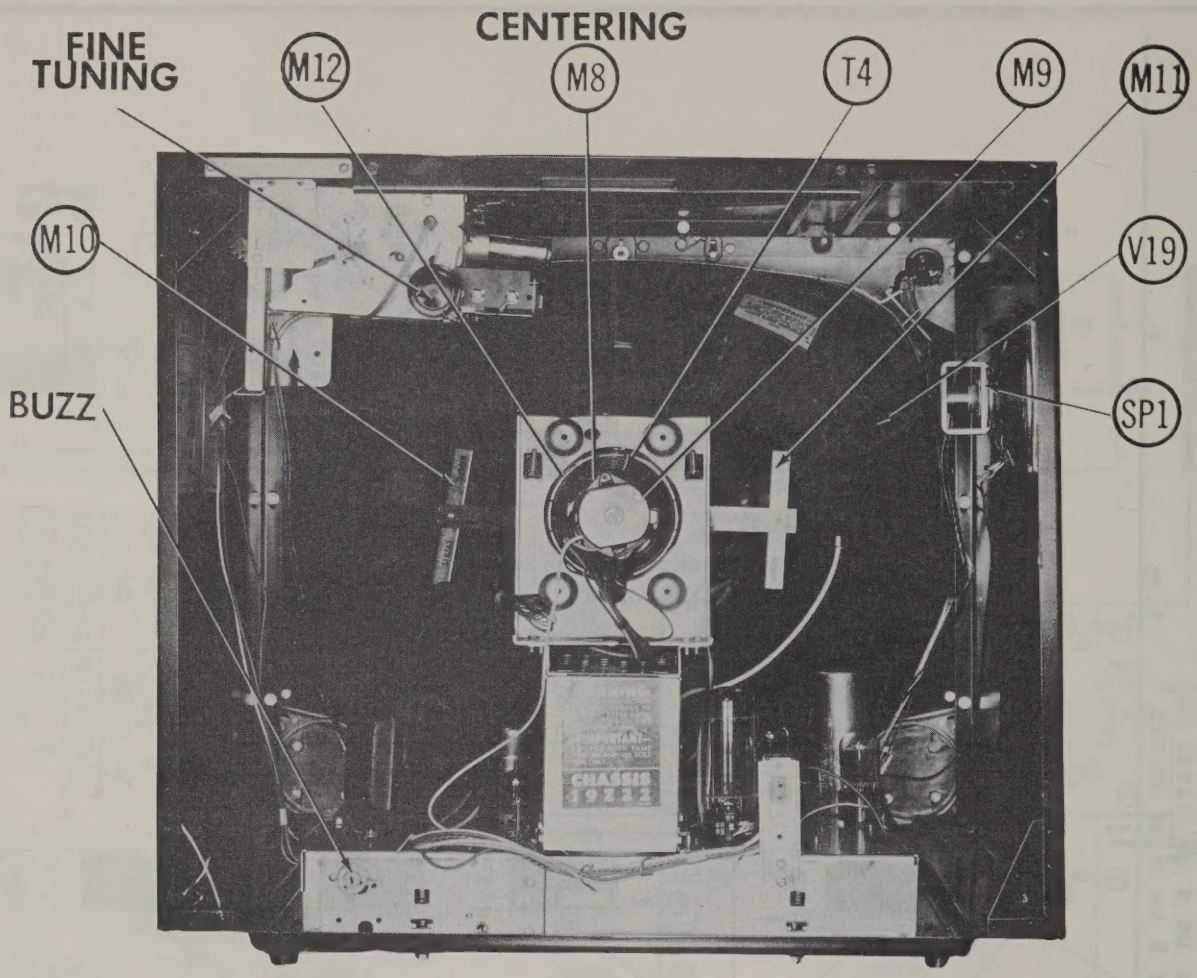
ALTERNATE VHF-UHF TUNER SCHEMATIC

PROPERTY OF
L. F. BLANKENSHIP
3014 MEADE ST.
DENVER, COLORADO



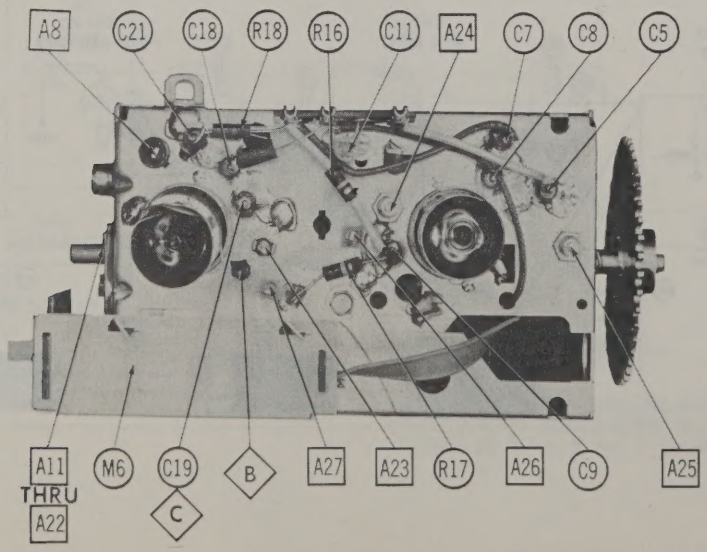
CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

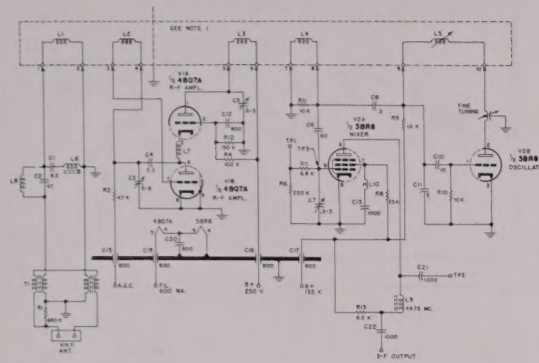
Adjust the horizontal hold control until the picture synchronizes horizontally.

Adjust the brass width sleeve on the neck of the picture tube for a picture slightly wider than necessary to fill the picture mask horizontally.

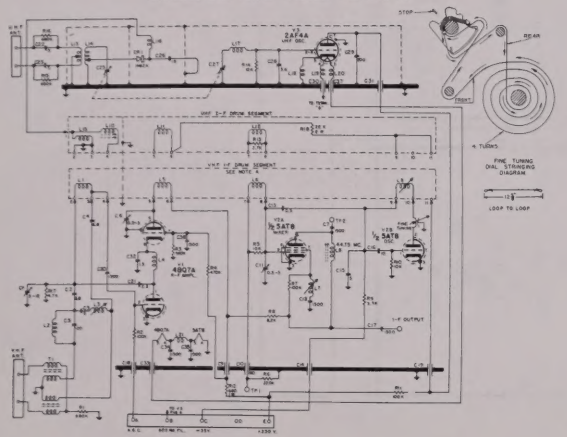


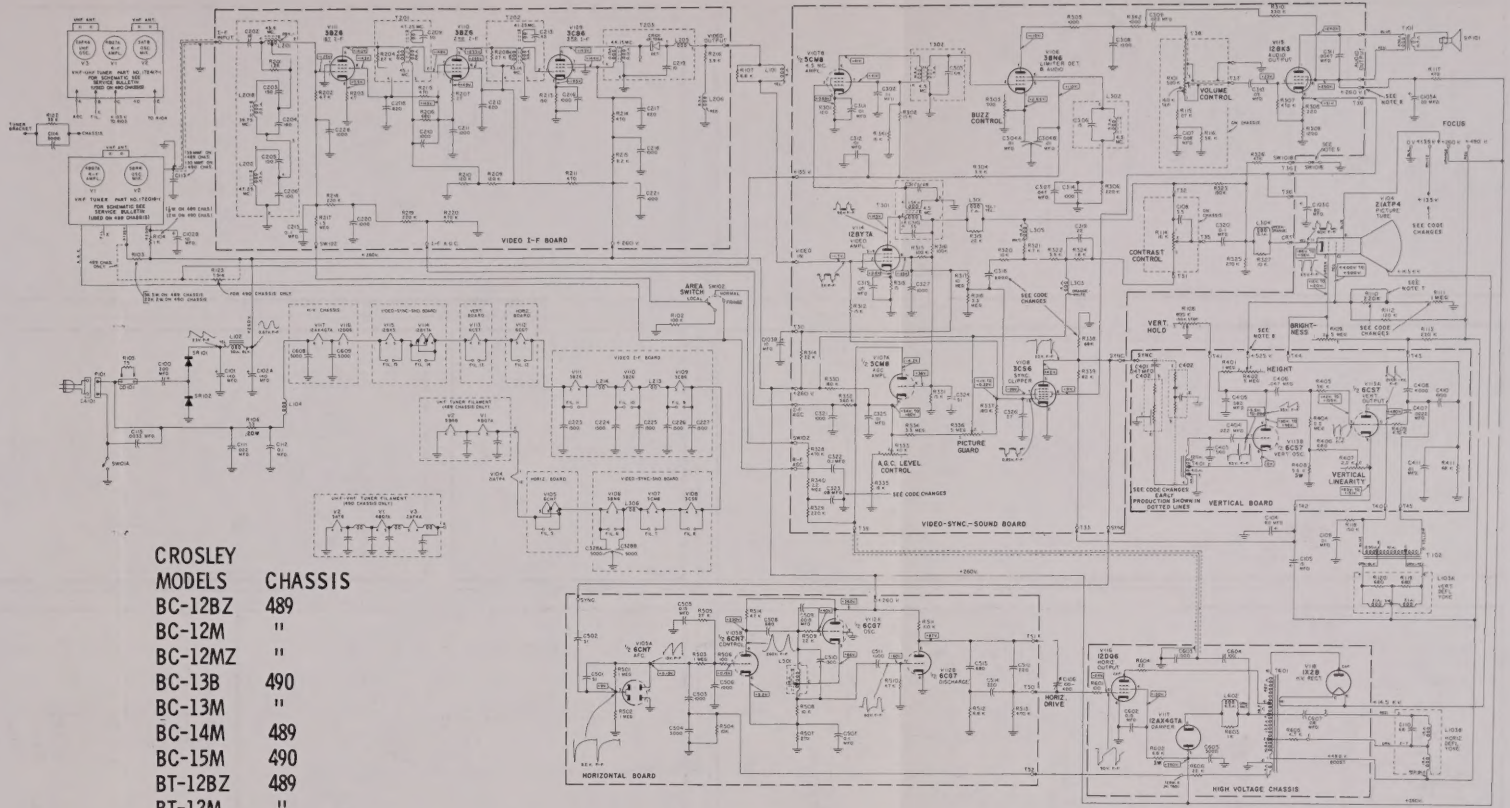
RF TUNER TOP VIEW

VHF TUNER PART NO. 172018-1
STANDARD COIL TUNER TDS-B-110



UHF - VHF TUNER, PART NO. 172417-1
STANDARD COIL TUNER TEAS-043



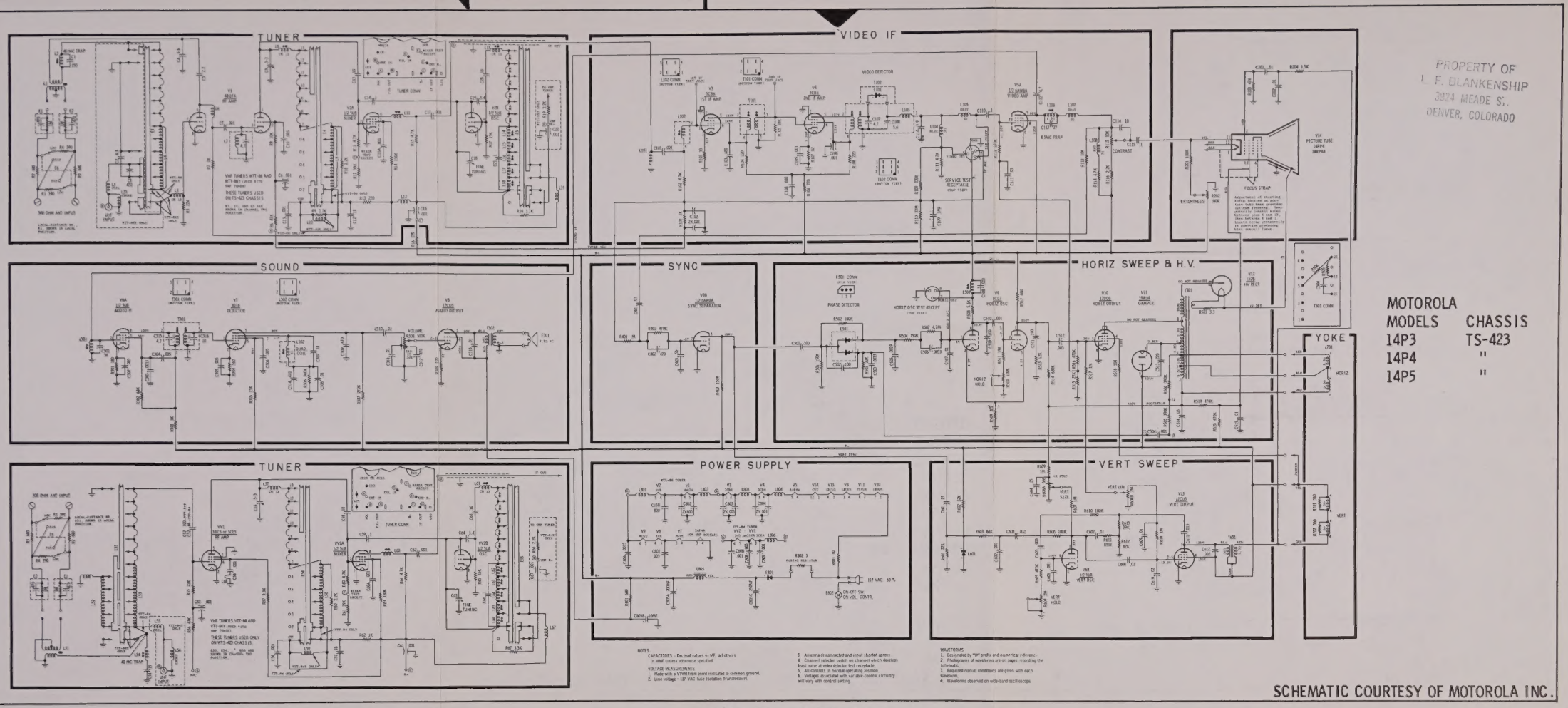


CROSLEY MODELS	CHASSIS
BC-12BZ	489
BC-12M	"
BC-12MZ	"
BC-13B	490
BC-13M	"
BC-14M	489
BC-15M	490
BT-12BZ	489
BT-12M	"
BT-12MZ	"
BT-13B	490
BT-13M	"

SCHEMATIC COURTESY OF CROSLEY Division AVCO Manufacturing Corp.

CROSLEY

MOTOROLA



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L. E. BLANKENSHIP
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DENVER, COLORADO

MOTOROLA MODELS	CHASSIS
14P3	TS-423
14P4	"
14P5	"

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SET 341 FOLDER 18-S